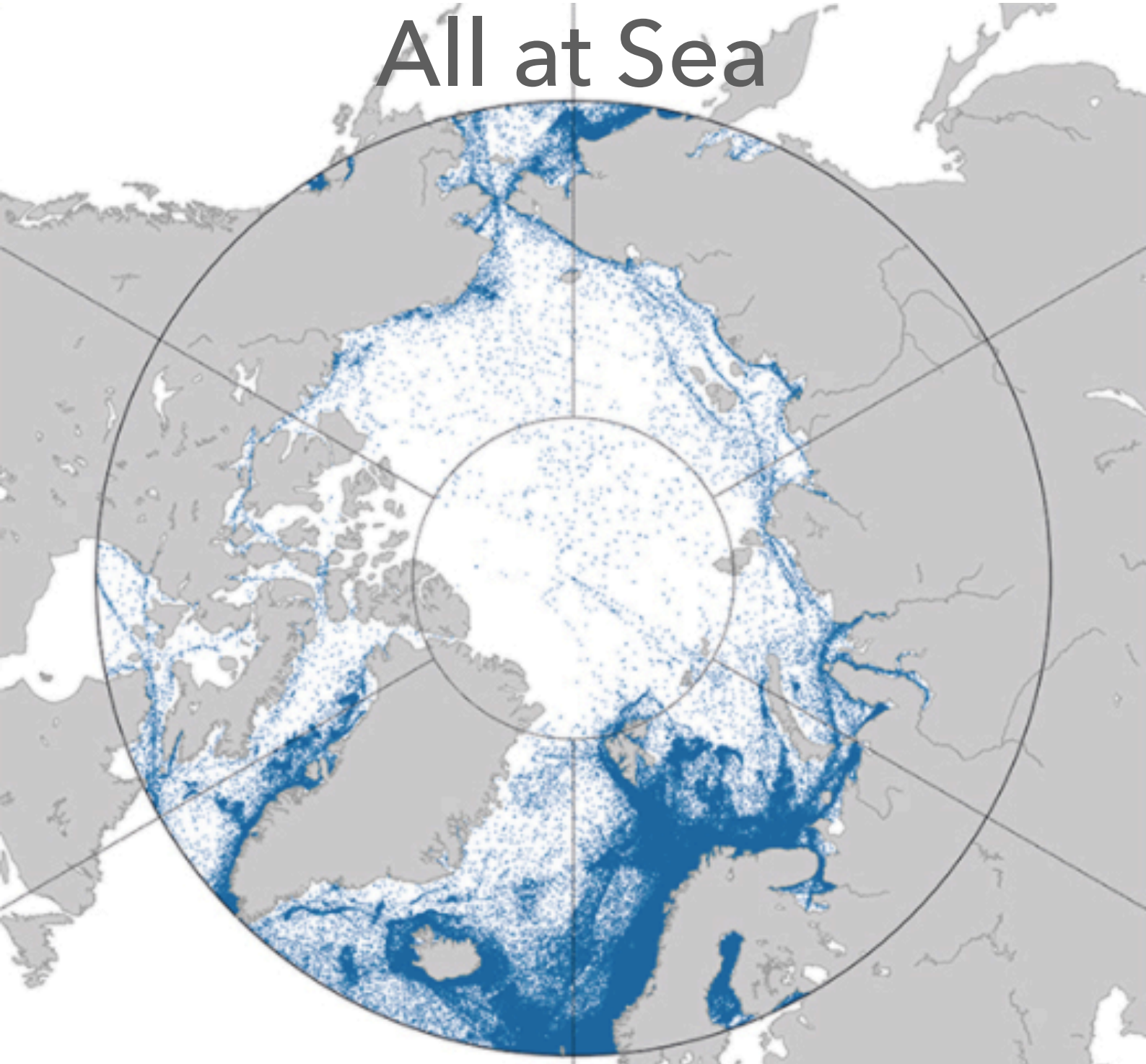
All at Sea



To what extent can differences in risk perspectives within organizations in naval cooperation affect risk communication and civil preparedness in the high North?

University of Stavanger

Master Thesis
Richard Utne
2017

UNIVERSITETET I STAVANGER

MASTERGRADSSTUDIUM I
RISIKOSTYRING OG SIKKERHETSLEDELSE

MASTEROPPGAVE

SEMESTER: Spring/Autumn 2017

FORFATTER: Richard Utne

VEILEDER: Lillian Katarina Stene

TITTEL PÅ MASTEROPPGAVE: All at Sea

EMNEORD/STIKKORD: Risk, Risk Perspectives, Risk Management, Risk Communication

SIDETALL: 127 pages including tables, figures, pictures, references and appendixes

STAVANGER : 02. November 2017
DATO/ÅR

«I was rather surprised to find that he seemed all at sea, and had no one ready to go with me»

- Frederick C. Selous (1893)

«All at Sea» is an extension of the nautical phrase «at sea», meaning «*In a state of confusion and disorder»*. It dates from the days of sail when accurate navigational aids weren't available. Any ship that was out of sight of land was in an uncertain position and in danger of becoming lost.

While the concept of the «High North» is commonly used by Norwegians, it´s meaning is widely open to interpretation (Skagestad, 2016). The concept is accepted and used widely eg. in offical Norwegian projects (*«Maritime Preparedness and International Partnership in the High North»*) and press releases (*«Increased funding for High North-related efforts»*).

This thesis defines the High North as the Norwegian Arctic Circumpolar (between the North Pole and the Polar circle), including the Norwegian Sea, Barents region and the Barents Sea, but with no clear borders to the adjacent seas. It is considered equal to the concept of the Arctic.

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Executive Summary

The Norwegian Ministry of Justice and Public Security emphasized in their 2016-2017 report to the Parliament, that the need for a common understanding of preparedness concepts and knowledge of how cross-institutional organizations use concepts and definitions is a prerequisite for understanding and interaction in preparedness and crisis response measures. The concept of civil preparedness means national measures to maintain or establish effective transportation during times of tension, crisis and war, in which merchant ships and thus naval cooperation plays a crucial role.

The thesis purpose is to discuss the research question: to what extent can differences in risk perspectives within organizations in naval cooperation affect risk communication and civil preparedness in the high North? In order to do so, investigating and associate prominent risk perspectives to organizations with roles and tasks to naval cooperation was necessary.

A scenario of a military invasion of Northern Norway published by the Norwegian Directorate of Civil Protection (DSB) is used for the thesis purpose because the concept of naval cooperation includes risk communication between stakeholders which is responsible for civil preparedness. In such a scenario the concept of naval cooperation will be in force and coincides with the DSB scenario. This enables an illumination of the research question.

The empirical data identifies that the representative organizations have splayed risk perspectives. This is represented within their own sectors and within the sectoral levels of communication. Based on five pre-defined risk perspectives, the overall prominent risk perspective seems to be a mix of ideas and concepts of risk. This applies both to the investigated organizations as well as the numerous documents, regulations, guidelines, and directives, also to the different organizations from the top level, to the educational system and at the operational level.

The empiricism holds consensus with a risk and vulnerability analysis of Norwegian food supply, which concluded that the greatest weakness is associated with the delegation of responsibilities between actors. and one of the suggested measures to improve civil preparedness is to examine the possibility of establishing a joint emergency plan for crises.

An important element in such joint emergency plan, also consistent with the Norwegian Ministry of Justice and Public Security 2016-2017 report to the Parliament, is the need for a common understanding of preparedness concepts, knowledge of cross-institutional organizations conceptual use of concepts and definitions in preparedness as a prerequisite for understanding and interaction in naval cooperation for civil preparedness.

Preface

The process of writing this thesis has been a challenging process and a steep learning curve. It would not have been possible without the participation of the investigated organizations in which has contributed with insight to this field of research. I am humbled over the time I have been granted with the highly professional people I have met along my journey.

I have been privileged with access to extensive resources. I would especially like to mention:

- My mentor at the University of Stavanger (UiS), Associate Professor, Major Lillian Katarina Stene, which has had the overall guidance of the work on the master's thesis. The risk management field of studies embraces principles, models, and methods for identifying, analyzing, describing, communicating and managing risk. From her lighthouse of knowledge, Stene has more than once aided my navigation and adjusted my course.

- The Norwegian Defence Research Establishment (FFI) and PhD Paul Magnus Hjertvik-Buvarp which has co-mentored me in the writing process and guided me through high seas. As the prime institution responsible for defense-related research and the chief advisor in defence-related science and technology to the Ministry of Defence and the Norwegian Armed Forces' military organization interdisciplinary, FFI offer assignments and guidance in a number of disciplines, mainly at the master's and doctoral level.

- My union, Lederne, for the generous scholarship.

To those who lights their lanterns upon me:

- Kristine. You rock my boat.
- Dad. I wish you were still on board.

1. Introduction

In 2016 I was deployed in international operations as Staff Officer for Naval Cooperation and guidance for Shipping, at NATO´s Maritime Allied Command Headquarters.

From my position, I observed the process of risk communication between different organizations in for naval cooperation in areas of operations. When NATO communicated with collaborating navies and organisations eg. in the Gulf of Aden or in the Mediterranean Sea, it required that the use of terms and concepts NATO used often had to be politically or legally reviewed before they were released.

After NATO had activated it´s article 5 and started patrolling the Mediterranean Sea in 2002, with the following events of the Arabic spring, the war on Libya and the refugee crisis of migrants crossing the Mediterranean Sea, several organizations started operations in the in the same geographical area. The complexity within and the need for communication between the different organizations grew proportionally with the increased numbers of actors on the scene.

Among these actors were the NATO operation Active Endavour, the European Union (EU) operation Sophia (EUNAVFOR MED) and Operation Triton (FRONTEX) from the EU´s border control, controlled by Police Authority. Additional Non Governmental Organizations (NGO´s) also operated in the same area, as well as navies from Mediterranean coastal states and non-Mediterranean states. The organizations were operating in the same areas with overlaping mandates or missions, with different communication systems, different classification systems and different cultures and different modus operandi and strategies to their missions.

As a consequence of the activity, the Shared Awareness and De-confliction in the Mediterranean (SHADE MED) forum was established. SHADE MED is a «forum where representatives from nations and organizations interested in or impacted by the migratory phenomenon in the Mediterranean basin can meet to deconflict and coordinate their Maritime Security Operations (MSO) by sharing situational awareness, assessment of the evolution of trends and best practices» (EEAS: Shared Awareness and De-Confliction in the Mediterranean).

After my deployment, my knowledge of the challenges in naval cooperation took interest in a report of Norwegian Ministry of Justice and Public Security 2016-2017 report to the Parliament. The report emphasized that the need for common understanding of preparedness concepts, knowledge of cross-institutional organizations conceptual use of concepts and definitions in preparedness is a prerequisite for understanding and interaction in preparedness and crisis response.

This report and my knowledge of the complexity of the process of risk communication between actors in the Mediterranean basin drew my attention to the basis for the founding of the research question. The context is placed in the geographical area of the High North, as this region is considered by the Norwegian Government as a key foreign policy priority (government.no/nordområdene).

1.1 The Research Topic

The Norwegian Directorate of Civil Protection (DSB) has published a risk and vulnerability analysis of Norwegian food supply (DSB 2017). The report concluded that Norwegian food supply is considered safe and sufficient. The presumption for the analysis is a normal trade flow.

Logistics is crucial for maintaining functional markets and is referred to in the DSB 2017 analysis as a prerequisite for civil preparedness. Of six unwanted events that represent different threats for food supply, developed for concrete scenarios that tell where the event occurs, what it actually depends on, the extent and duration it has, etc., the analysis presents a scenario of a military invasion of Northern Norway (Appendix A).

The scenario of a military invasion of Northern Norway is used for the thesis purpose because the concept of naval cooperation includes risk communication between stakeholders which is responsible for civil preparedness. The concept of naval cooperation will be in force and coincides with the scenario for a military invasion of northern Norway. This enables an illumination of the research question.

In the scenario, a coincidence of broken infrastructure, a hostile control of the air domain and constraints on transport through neighbouring countries can lead to a significant extension of the lead times for transport to northern Norway. The scenario assumes that the main transport routes between Central Norway and Northern Norway will be blocked, as Norway currently has no agreements with Sweden and Finland that ensure the use of their transport network for acts of war in Norway. If supply routes through Sweden and Finland should also be closed, it will have major negative supply consequences. In the longer term, that is, with a duration beyond one month, it will be necessary to find alternative transport routes ie. ship transport. Therefore, it is important that the organizations are interconnected and have common use of conceptual terms and definitions so that civil preparedness is designed for such a scenario.

In the long-term plan for the Armed Forces (Prop. 151 S 2015-2016), the concept of civil preparedness means national measures to maintain or establish effective transportation during times of tension, crisis and war (Meld. St. 10 (2016–2017)). Airfields, railways, maritime transport and ports, are vital to maintaining the flow of supplies, to ensure efficient transportation of military equipment and to keep the society running. The modern society is built on tight couplings and it is the same transportation network, the same infrastructure, that ensures both transportations of food as military equipment. In 2016, an amendment to the National Crises Response Manuals was made for a national Implementation for the roles and tasks for implementation of Naval cooperation in crisis and conflict. The amendment applies to the following actors:

- The Norwegian Joint Head Quarters (NJHQ)
- The Naval Staff
- The Coast Guard Staff
- The Home Guard Staff
- The Norwegian Coastal Administration (NCA)
- Port Authorities
- The Police
- Merchant shipping and fisheries

1.2 The research question

The DSB 2017 risk and vulnerability analysis of Norwegian food supply concluded that the greatest weakness in civil preparedness is associated with the delegation of responsibilities between actors. One of the suggested measures to improve civil preparedness is to examine the possibility of establishing a joint emergency plan for crises.

The Norwegian Ministry of Justice and Public Security emphasized in their 2016-2017 report to the Parliament, that the need for common understanding of preparedness concepts and knowledge of how cross-institutional organizations use concepts and definitions is a prerequisite for understanding and interaction in preparedness and crisis response measures (Meld. St. 10 (2016–2017)).

The research topic is, therefore, to associate prominent risk perspectives to the organizations with roles and tasks in naval cooperation. The task has chosen to expand the investigation to include their main organizations. For example, the Norwegian Defense University College will have influence in the Norwegian Joint Head Quarters or the Coast Guard through their education system. Thus is how the organizations use concepts and definitions internally also of interest to the research question.

The organizations with roles and tasks in naval cooperation which are subject to investigation in this thesis are:

- The Norwegian Ministry of Justice and Public Security with subordinate divisions
- The Norwegian Coastal Administration with subordinate divisions
- The Royal Norwegian Ministry of Defense with subordinate divisions
- Central Maritime Organizations

When organizations have an unlike understanding of the term risk in risk communication, this could lead to misunderstandings or confusion between (say) an analyst and a decision maker or between cooperating organizations.

This may affect civil preparedness because if a common understanding of the concept of risk is one of the prerequisites for civil preparedness objectives, a subordinate research question is to investigate to what extent differences in risk perspectives can affect communication and assessments related to civil preparedness in the high North.

In light of the scenario of a military invasion in northern Norway, based on a set of five defined risk perspectives (Veland, Aven, 2012) in the analytical framework, the main research question is to investigate; to what extent can differences in risk perspectives within organizations in naval cooperation affect risk communication and civil preparedness in the high North?

1.3 Limitations

There are extensive literature, definitions, standards and theories for risk management. This thesis does not take a stand to a «right» or «wrong» perspective, nor does it investigate all theories and perspectives of risk. Its purpose is to associate prominent risk perspectives within the organizations vital for naval cooperation (in accordance with the amendment to the National Crises Response Manuals) and to what theoretical extent such differences might effect risk communication and thus civil preparedness. The theoretical foundation is based on a theory set of five different risk perspectives by H. Veland and T. Aven (2012).

Organizations definition of risk is often found in open sources, such as websites or in a white paper. It is however in the nature of the interest for some of the organizations subject to investigation to classify such information, and in some examples, information is excepted publicity. This means that some information may not be presented in open sources nor upon request and that the accessible data might not represent the complete picture nor be subject to full exploration and in such circumstances, this can give a wrong associate prominent risk perspective.

The comprehensive literature of risk is dynamic and extensive. News and articles about situations that may affect the investigated organizations perception of risk are regularly published, eg. in articles in newspapers or online. Therefore, associated risk perspectives might be subject to change perceptions of risk in light of such events. Due to the extensively published literature, the list of previous research is not complete.

The three-layer model used to associate prominent risk perspectives contains a layer of document studies of data from articles, official reports, documents, literature and newscasts. Due to the enormous proportions of available data, and in some occasions also the restricted access to relevant data, only a limited selection has been possible to study and this data could thus contribute to a false association to a prominent risk perspective.

In the forming of this thesis, the Joint Rescue Coordination Centre (JRCC) in Bodø was included in the questionnaire. The JRCC is not considered an directly responsible actor within naval cooperation in the National Crises Response Manuals. But as a subdivision within the Ministry of Justice and Public Security and an important organization within civil preparedness, they are considered relevant to identify a consensus of associated risk perspectives within this organization. Despite being an actor to naval cooperation in the National Crises Response Manuals, fisheries are not included in the investigation.

1.5 Previous research

Despite extensive literature and research on risk perspectives, there is no research directly associated to what extent can differences in risk perspectives within organizations in naval cooperation affect risk communication and civil preparedness in the high North

The Norwegian government long-term defense plan presented to the parliament in 2016 («Kampkraft og bærekraft»), recognizes the dependency on reinforcement from NATO in times of crisis or war and commits to increase its presence of force in the High North. The Royal United Services Institute (RUSI) is an independent think tank engaged in cutting-edge defense and security research (rusi.org).

In a recently published book «NATO and the North Atlantic - Revitalizing collective defence» (Olsen et.al, 2017), the book suggests an improved cooperation and coordination between allies in the High North would gain profit to the rest of Europe (Efjestad, 2017 p.74). Investment in training and exercise of naval cooperation in the Atlantic and the High North, including contingency planning, maritime strategy and improved cooperation and coordination between actors with jurisdictional responsibilities within naval cooperation is thus a requirement to establish a trustworthy level of civil preparedness to Norway´s long-term defense plan (Efjestad, 2017).

In 2016, the Norwegian Defence Research Establishment (FFI) published a report of methods for classification of Norwegian ports. Its purpose was to establish a guide for risk assessments for the Norwegian Coastal Administration (NCA) related to the administrations monitoring of Norwegian ports and their regime for security, including establishing a maritime security level in Norwegian ports at a heightened threat level (Maal, Brattekås, Johnsen, Bruvoll and Riis, 2016).

The report discusses the use of different standards for risk protection against intentional undesirable actions and requirements for security risk analysis. The report concurred with the perspective of uncertainty in risk assessments, specifically related to terrorism, and the relevance of how risk analysis and risk assessments are conducted where such threats are representative factors. The traditional risk assessment methodology of probability x consequence to quantify a risk score, or a risk matrices for determining risk levels from values of consequences and probabilities, is argued not to be expedient for security-related risk assessments (Maal, Brattekås, Johnsen, Bruvoll and Riis (2016), p-29).

In another report from FFI, approaches to security risk assessments for protection against intentional unwanted actions (Busmunrud, Maal, Hagness Kiran, Endregaard (2015), FFI report 15/00923) are being investigated and discussed. The 15/00923 report was funded by the Norwegian Defence Estates Agency and its objective was to compare the agency´s operationalization of two risk approaches for securing of their properties. This report goes into depth of the risk concept and discusses different Norwegian Standards (NS) of risk management (NS 5814 and NS 5832) as well as how different major organisations approaches to risk assessments for unwanted actions; The United Nations (UN), The European Union (EU), the North Atlantic Treaty Organisation (NATO) and leading scientist environments.

A master thesis from the Arctic University of Norway (J. Loland, 2014) «Risk Communication - How to succeed in communicating risk», from studies of security and preparedness in the High North at the Nord University, investigated risk communication in two counties in Norway. The

thesis concluded that the key focus areas can be listed in the terms of «trust, communication of messages, dialogue and awareness of the audience», and in order to succeed in communicating risk, it is important to have a comprehensive approach that includes all these factors as well as awareness of the level at which the risk communication debate is being spelled out. The thesis does not go into depth of scientific perspectives of risk, nor does it investigate what risk perspectives the objects subject to the investigation have, or how different risk perspectives between different actors might influence risk communication in relation to assessment and management of risk. Still, the thesis concludes that the use of technical experts in risk communication will still have a role in removing scientific uncertainty, but the debate will be increasingly influenced by «human values and cultural convictions». The thesis refers to Aven (2010), and suggests an approach to risk communication with words that describe the uncertainty about the knowledge, then describe the probability estimates both with numbers and words.

C. Hille and C. Nordbø Myr (2016) Master thesis´ in Security-culture «Hva kan Marinen som organisasjon gjøre for å forbedre security-kulturen?» identified lack of competence and understanding of the concepts of threats, values, and vulnerabilities in the Norwegian Navy. The empiricism associated a missing red line in the field of education within the field of security in the Norwegian Armed Forces educational system. Furthermore, the thesis discovered that unclear use of concepts, divergent practices between departments, lack of resources and guidelines on what is required to handle the security field, complicated the management of security at an overall level in the organization. Interview findings also showed that the Navy did not have a sufficiently robust security organization, with partially unclear responsibilities, and, despite lack of understanding the decision was made on what was reportable at the lowest level.

John Lund´s (1989) report «Don´t rock the boat» examined how the Norwegian policy on deployment of foreign troops was advocated to avoid «rocking the boat», to risk a NATO article 5 operation during the cold war. In his report, Lund focused on air reinforcements, with improved air base defense and construction of an additional air base in the High North as a measure for preparedness. As an option, air reinforcements could be transported by ship to ports near air bases (Andenes for Andøya, Bogen Bay for Evenes and the Port of Bodø). Lund did not investigate risk models, but his report is (still) relevant for a comprehensive approach to naval cooperation with regards to transportation of supplies in the event of a crisis in the high north.

Recently published literature which is relevant to Maritime Security is Katarzyna Zysk´s (2016) Chapter: «Maritime Security and International Order at Sea in the Arctic Ocean» in «International Order at Sea - How it is challenged. How it is maintained» (Bekkevold et.al 2016). Zysk´s chapter discusses security-related risk factors at sea in the High North but does not go into depth at explaining the definition of the risk concept.

The Maritime Preparedness and International Partnership in the High North (MARPART) project has assessed maritime risk in the High North. The project focused on cross-institutional and cross-country partnerships between preparedness institutions and companies, and elaborated on the operational management of joint operations including several parts of the preparedness system and resources from several countries. To increase both effectiveness and efficiency within the preparedness system, the project emphasized in its conclusion the governmental responsibility for preparedness as to safety, security and environmental protection in the High North and *«the need of management tools for coordination and control, making optimal use of the joint resources of several institutions both within and between countries»*.

2. The theoretical foundation

The theoretical foundation of the concept of risk has been studied for centuries and the recognition amongst laity of a «true» risk is common, even amongst experts (Aven, 2007). Modern risk management involves how to understand and behave to achieve a maximum potential of the objective with a minimum of consequences related to an identified risk. Despite risk management being a relatively young concept in today's society, most modern organizations adhere to some kind of risk management system. Regardless of economic or security issues, modern leadership is based on management by objectives. Objectives are analyzed and broken down to identify and allocate resources to meet the objectives, often in a cost-effective manner.

There are many models and theories about risk management in which two are accounted as the basic elements. The High Reliability-theory (Marone and Woodhouse (1986), La Porte and Consolini (1991), Roberts (1989;1990) and Widavilsky (1988)), developed at Berkeley, University of California, and the Normal-Accident theory (Charles Perrow,1984). Each theory is representing opposite risk perspectives (Aven, Boyesen, Njå, Olsen and Sandve 2004).

2.1 Common definitions of risk

Since the thesis aims to associate risk perspectives within different institutions, it is necessary to be familiar with what is common differing perspectives, what they consist of and how they may be expressed. Of the many definitions of risk, the most common definitions (or risk perspectives) are listed below (Aven, 2014). The complete summary of definitions with features is listed in Appendix B. Summarized, risk (R) can be defined as;

1) Expected Value (loss), (R = E)
2) Probability of an (undesirable) event, (R = P)
3) Objective uncertainty, (R = OU)
4) Uncertainty, (R = U)
5) Potential/possibility of a loss, (R = PO)
6) Probability and scenarios/consequences/severity of consequences, (R = P,C)
7) Event or consequence, (R = C)
8) Consequence/damage/severity of these + uncertainty, (R = C,U)
9) The effect of uncertainty on objectives (ISO 2009a,b), (R = ISO)

By the many definitions of risk, experts argue that the perception of a «real» (objective) risk is not expedient when approaching risk. Neither does the perception of a subjective risk balance the opponent, as this will implicate subjective and objective results - while there in the real world only exists subjective approaches (Aven, 2007). This is because traditional risk analysis is a concept of analyzing historical data combined with experience and knowledge.

In a traditional risk perspective, engineers modeling a bridge could describe the probability of mechanical fatigue in relevance with statistical data for the substances in the construction, eg. steel, and concrete. The probability of the bridge to collapse could be expressed as a value, eg. based on the statistical data on comparative constructions, and this risk data be considered as a «true» risk.

2.2 The analytical framework

The analytical framework is based on a set of five different risk perspectives (Veland and Aven, 2012) in which this thesis has adopted for the analytical framework. These five risk perspectives will be the basis of associating risk perspectives to the organizations subject to investigation in this thesis and will be clarified in the following subchapters;

- The perspective of an objective risk
- The perspective of uncertainty
- The non-probabilistic perspective (The perspective of an underlying objective risk based on frequentist probabilities)
- The chaotic perspective
- The perspective of perception

A risk perspective pillars our approach to the way we understand risk. It is the backbone of preparedness and crisis response and it can be based on culture, experience, perception, and science. As there exists no unified, no overall agreed understanding or definition, no one holds the true answer of a «right» or «wrong» perspective to the of the concept of risk.

However, when approaching probabilities and uncertainties, assessing risk and black swans or when considering cost-effective decisions or decision-making principles to ensure civil preparedness, it is necessary that all relevant actors anchor their risk perspective in a solid scientific seabed.

2.2.1 The perspective of an objective risk

Jacob Bernoulli´s (1654-1705) work on the probability theory in 1685 ended up in publishing his «law of great numbers» in 1689. His interpretation of probability as relative-frequency says that if an experiment is repeated a large number of times, then the relative frequency with which an event occurs equals the probability of the event. The law of large numbers is a mathematical interpretation of this result.

In reference to Bernoulli´s theory, throwing a dice would give you a 1/6 chance of a given number because there are 6 possible outcomes with equal possibilities. In his theory of large numbers, in an infinite game of dice, the chance of throwing the given number equals 1/6. This number can be estimated by throwing the dice in a representative number like political opinion polls are made by statistical bureaus. Maybe temptation for fame drew his attention to try to predict - and communicate - probabilities outside the gaming table. Using the expression «moral certainty», Bernoulli wanted to predict the risk of an incident or action to occur within a period with a 1/1000 probability. His plan to include good examples in his book was never accomplished.

Using Bernoulli´s example, Aven argues one simply cannot use objective numbers to credit future probabilities and is often referred to as «naive positivism» (Aven, 2007). Aven (2007) uses a game of dice to explain risk mathematically. In a game of dice, there is 1/6 probability of throwing a given number. Given Bernoulli´s probability theory, and in a natural-science perspective, the expected value in an infinite repetition of rolling the dice would be 3,5. In this game, a person is challenged to receive 6000 $ if he or she throws 1,2,3,4 or 5. But if he or she throws 6, the consequence is to lose 24000 $.

If an analyst presents a decision maker the objective risk perspective to the game of dice, he or she could decide to play the game because their perception of the associated risk is considered low based on trust upon the statistical probability of winning. Given the expected value of the dice, one could expect to gain profit on the game. In the natural science perspective, risk is expressed as probability x consequence (R=PxC). The expected value of the game is 5/6 probability of 6000 $ profit + 1/6 probability of 24000 $ loss:

5/6 * 6000 + 1/6*24000 = 1000 $ expected average profit (expected value)

Still, in today's society, we are taught the nature-technical science principle´s definition of risk as risk = possibility times consequence (R = P x C), because we are constantly seeking answers about probabilities, safety, and security with a recognition of «truth» (Aven, 2007). Aven argues these questions nurtures a distinction between the real risk and the perceived risk, and that there is neither an objective nor subjective true risk.

The objective theoretical perspective defines risk as R = Probability and scenarios/consequences/ severity of consequences (R = P,C) or Risk = Expected Value (Loss) (Appendix A, Veland and Aven (2012), Aven, 2012).

2.2.2 The perspective of uncertainty

If a decision maker is presented with the objective perspective to the game of dice, he or she could decide to play the game because their perception of the associated risk is considered low based on trust upon the statistical probability of winning (the perspective of an objective risk).

The human nature attempts to reduce risk when exposed to uncertainty. If an analyst succeeds to express uncertainty, this might affect the decision on risk-taking. Risk aversion is the behavior of how humans relate to uncertainty. Challenging the established concept of risk, several scientists argues for the validity of uncertainty in risk management and the need to systemize knowledge and the connected uncertainty to the consequence of the activity and that this can be done by methods and models for probability (Aven et. al, 2004, «Samfunnssikkerhet», p - 64). In the perspective of uncertainty, the expressed risk is a systemic knowledge of the unsure. Risk mitigation measures can be implemented but the risk cannot be removed completely. Thus the need for tools to communicate this uncertainty in a concise and clear matter.Aven (2007) explains uncertainty In the game of dice (chapter 3.1) risk mathematically; In Avens perspective of uncertainty, a risk-based approach, the risk is expressed as «the consequences of an activity with the associated uncertainty» (c,U). In this perspective, the consequence of losing is:

24000 $ (-24000*1/6) = -4000 $ in average profit (expected value)

In Aven´s uncertainty perspective, to question if the dice are loaded or why someone wants to play these rules is relevant to identify uncertainty associated with consequences of the game. The uncertainty can be expressed with probability. Estimating risk, probability in a classic context is an estimate of an expected value. An assigned risk number is a measurement of uncertainty. A given number, 0.4 would express the analytic´s uncertainty to draw a black marble from a jar with 4 black and 6 white marbles. However, this uncertainty is someone's uncertainty based upon their knowledge.

Opposite to the theory of an objective risk (R) is the theory of a subjective probability. The subjective probability (P) theory considers the analyst´s uncertainty to whether an event (A) occurs (eg. P(A)=0,1), expressing the analyst´s uncertainty equal to draw a destined marble out of a jar with ten marbles. This perspective opposite the perception of a «true» risk. However, Aven (2007) argues that a subjective risk as the opponent to an objective risk would imply other results from another analytical approach to be objective.

In the uncertainty perspective, there are >two dimensions associated with uncertainty; the uncertainty associated with the knowledge-based probability and uncertainty associated with the assessor (Aven, FFI report 2015/00923). The uncertainty perspective defines risk as consequences/ damage/severity of these + uncertainty (R = (C, U)) (Appendix A, Veland and Aven (2012), Aven, 2012).

2.2.3 The non-probabilistic perspective

In the game of dice, the expected value is 3,5. However, frequentist probabilities represent the extremities in this expected value with the extreme numbers of 6´ and 1´ (on the dice) representing the oscillating frequency range. An underlying objective risk is based on frequentist probabilities, accepting that there is a range of numbers possible.

A stochastic variable (a random variable) in the game of dice is [1,2,3,4,5,6]. The dice has 6 variables, as before the throw is defined as X = x where X is an action and x is a value. For each throw, the X allocates the value of x from its starting point.

In the perspective of an underlying objective risk, based on frequentist probabilities, the perception of stochastic uncertainties, «non-probalistic» methods are considered sufficient to communicate epistemic uncertainties. Aven (2010) argues this uncertainty not to be the uncertainty of the analyst because a probability is always conditional on a background knowledge. Hence, the non-probabilistic risk perspective rejects subjective probabilities unless the information is very strong (Veland and Aven, 2012), and this burden of evidence represents an objective (and retrospective) risk perspective. The non-probabalistic perspective defines risk as R = Probability and scenarios/ consequences/severity of consequences (R = P,C) or Risk = Expected Value (Loss) (Appendix A, Veland and Aven (2012), Aven, 2012).

2.2.4 The chaotic perspective

Despite the chaotic perspective sounds unprofessional or little flattering, it maybe reflects the challenges due to the fact that most people are employed by their profession (eg. a navigator, a subject matter expert or as a politician) and not as a risk analyst. The chaotic perspective is therefore considered a common perspective within all kind of actors (Veland and Aven, 2012).

The chaotic perspective implies that the transmitter and the receiver of the assessed risk have no scientific foundation upon the results of the risk assessment, that risk assessments and decisions are not founded in a scientific approach, or, that the perception of risk holds a mix of various ideas about central concepts of probability and uncertainty. In the game of dice, in light of the chaotic risk perspective, an analyst would fail to express the scientific approach to the analyst and the decision maker´s prerequisites to analyze the assessment would be inadequate.

Establishing a communication process between a chaotic perspective and the non-probabilistic or the uncertainty perspective would be challenging due to the complexity of these perspectives, and most likely the communication process would gain mistrust to the risk assessment (Veland and Aven, 2012). The chaotic perspective has thus no applicable formula to express risk.

2.2.5 The perspective of risk = perception

The perspective of perception is a judgment (belief, appraisal) held by an individual, group, or society about risk (Veland, Aven, 2012). Risk perception may have been influenced by a variety of sources. An example of means to influence a public perspective is a «new» element of warfare (often referred to as «trolls» or «hybrid warfare») as a strategy to influence public opinion and perception through eg. social media and in online news sources.

Studies of risk perception show that the concept of risk easily arises inconsistencies between common people's assessment of risk on the one hand, and statistical accident and injury rates on the other hand (Aven (2007) «risikostyring» p-54.). The subjective perception of risk, what people are inclined to regard as safe and unsafe may vary a lot. Many perceive new, unknown substances and technologies as riskier than the familiar, and a controlled activity may be perceived as safer than one that yourself can influence.

Risk perception may differ, depending on the perception of personal affection to values. Studies have shown apparent different risk attitudes between managers when they make decisions based on personal versus company values or when evaluating financial versus recreational risks (Weber, Blais, Betz, 2002). In 2002, Danial Kahneman and Vernon Smith won a Nobel prize in Economic Sciences for having «integrated insights from psychological research into economic science, especially concerning human judgment and decision making under uncertainty» (nobelprize.org). Their study showed when faced with uncertainty, most people adhere to cognitive biases, or «pre-programmed» judgments based on experience, or gut feeling, as shortcuts to decisions.

An individual with a high-risk aversion could be willing to put his money on a stock with a high risk. Although acknowledging their money could be lost if the stock plunges, they might consider the risk affordable in terms of a possible high expected return. Another dimension of this risk aversion could be the «thrill» of taking the risk itself. Such aversion could be founded on a recognized picture with assumptions on probable behavior or movements within the basis of previous experience. An individual with a low-risk aversion could consider the game of dice (chapter 3.1) irresponsible and place his money in a low-interest bank account, neither recognizing the possible payoff nor the thrill of the «game» worth the possible consequence.

Another person might be indifferent in whether to play or not (risk-neutral). Co-incidents such as their mood could affect the lust of adventure the risk - or not. A person with a high-risk aversion (risk-loving) could accept the risk both because of their perception of the probability of profit and also because of the thrill of the game itself. They could consider the risk of loosing as acceptable because the gain of thrill from the game is considered a profit itself. A person with a low-risk aversion (risk-averse or risk-avoiding) could possibly refuse the game by a principal. But he or she could also decide to play the game because their perception of the associated risk, maybe upon consultancy or advice, is considered low based on trust upon the statistical probability of winning.

An illustration of the concept is if you polled the perception of public safety in Norway right after the July 22 terror in Oslo, It would likely be much lower than right before the terror. This illustrates that the real world is unpredictable and shifting and that the concept of risk in the perspective of perception is subject to dynamic and contextual interpretations.

The perspective of perception implies that the transmitter and the receiver of the assessed risk have no scientific foundation nor validation upon the results from the risk assessment, and allows personal affections such as feelings and emotions to reflect their perception of risk (Veland and Aven, 2012). An example associated with the risk = perception perspective is the US strike on a Syrian air base in April 2017. According to newspapers, President Donald Trump was influenced by his daughter when he decided strikes as a response to chemical weapons used on civilians (The Telegraph,11.04.17). The risk = perception perspective has no applicable formula to express risk.

2.3 Factors that might affect risk assessments and risk communication

The concept of risk is not straightforward. The knowledge of risk and risk management is still a relatively young discipline, and in terms of practical use, risk management is complicated without both practical and theoretical experience (Aven, 2007). As there are indeed many theories and perspectives on risk, chapter 2.3 aims to present what factors that might affect risk assessments and risk communication.

2.3.1 Black swans

Risk assessments are often used to identify threats or an unwanted state. How an unwanted incident or action that may occur, and which organizations area of jurisdiction does this event belong to are relevant to the assessment. The Norwegian Directorate for Civil Protection (DSB) defines scenarios for risk assessments as «a detailed and specific description of an unwanted action; a description of a future state and the path to what caused it» (FFI-report 2015/00923).

When assessing risk, foreseeing the unforeseen is a challenge. In 2007, Nassim Nicholas Taleb published his book «The Black Swan». Talebs theory of black swans are unexpected events or incidents with a high impact, which deviates beyond a reasonable expectation of a situation, which causes behavioral and psychological changes within societies and is extremely difficult to predict. Counting Black Swan events, Taleb includes events as World War I, the development of the Personal Computer, the Internet and the 9/11 attack. Taleb does not try to predict unpredictable events but says risk management should build resilient systems. According to Taleb, a Black Swan is;

1) A surprise to the observer
2) An event with a major impact
3) The event could have been expected if relevant data was available and accounted for.

In his book «Risk, surprises and Black Swans» (Aven, 2014), Aven argues the key to meet and understand black swans is based on the knowledge dimension, taking into account the discourse of variation and unpredictability as well as the conceptual aspects of risk and uncertainties. The future is characterized by great uncertainty and therefore one should not put too much emphasis on historical data, nor should risk be based on what you see rather to what you do not see, as this is where the black swans are. Aven concludes that new risk perspectives illuminate surprises and a better understanding of how to assess and if not prevent, reduce and to a degree manage black swan events. With reference to Taleb´s three characteristics of black swans, Aven (2014) defines black swan events as a «suprising, extreme event relative to present knowledge/beliefs» (Aven, 2013);

1) Unknown-Unknowns, which are new events to science, characterized by unpredictability and unimaginable consequences (eg. a new bacteria or virus).

2) Unknown - known, which are events unknown to many but known by few. Such events are often not identified due to lack of knowledge, despite knowledge of vulnerability amongst individuals.

3) Known events, which are events identified in a risk assessment but considered little probable and thus not considered to occur with great consequences.

2.3.2 The risk analysis methodology

A central element in naval cooperation is assessing and communicating risk in and between different levels of organizations. In general, a risk assessment should identify and describe risk to present a situational awareness picture (Aven, Røed, Wiencke, 2008). The categories of risk analysis are divided into three main categories; simplified, standard and model-based (table 1):

Category	Approach	Description
Simplyfied	Qualitative	Identifying risk through teamwork and brainstorming, presenting risk in a simplyfied matter without formal methods.
Standard	Qualitative or quantitative	Formalized methods as HAZOP are used, often presented in a risk matrix
Model Based	Primarly quantitative	Advanced models and techniques eg. Bayesian models

Table 1: Main categories of risk analysis

A general category of risk analysis or risk assessments does not describe or suggest a risk perspective, only the approach, and method for the assessment. The results from a risk analysis, or assessment, is often presented in a matrice with a color scheme (red, yellow, green) to visualize possible consequences where the risk acceptance criteria define the maximum level of risk. If the calculated risk is within this zone, the risk is considered (un)acceptable and the color regime is intended to visualize the consequences of the risk assessment.

This method often leads to the aim of reaching acceptable levels of risk (eg. by compensating measures), rather than what is relevant in association to the risk. This may lead to generating alternative such as best available technology (BAT) and ALARP (As Low As Reasonable Practical) principles, cost-effectiveness and management involvement in making decisions (Aven, 2007).

Though the approach to risk analysis might be structured by one of the three main risk assessment categories, if fundamental concepts like probability, uncertainty, and risk are not properly understood, there will be no scientific foundation present that can provide proper interpretations of the quantities presented (Veland, Aven, 2012).

2.3.2 Risk assessments in light of the time dimension

When assessing risk we consider a time frame (figure 4), where the point in time s refers to «now» and indicates when the activity is to be assessed or managed, as well as defining which part of the analysis can be regarded as history and which part of the future (Aven 2014).

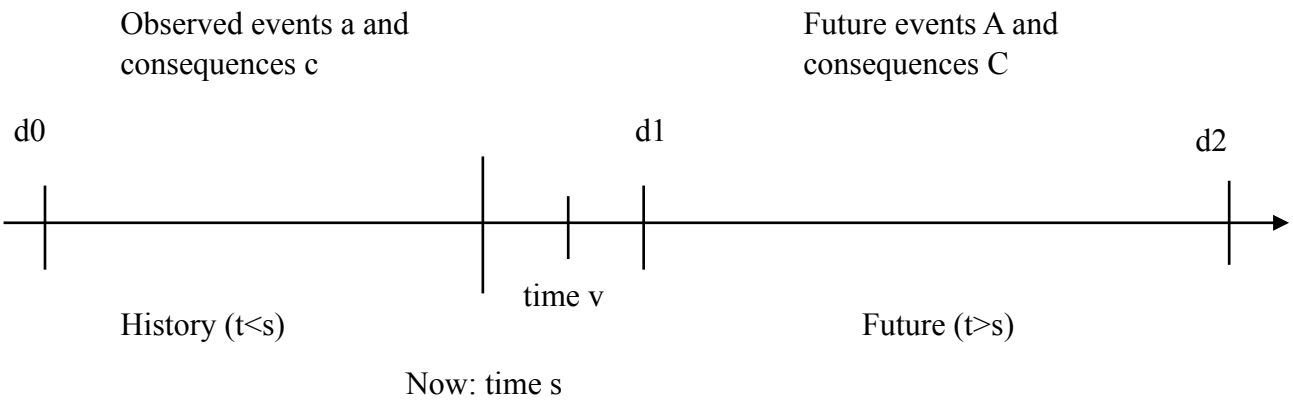


Figure 1: Components of the risk concept in relation to the time dimension (Aven 2014)

Cs refers to a set of quantities that is introduced to characterize the events A and consequences C in the period of interest, for example, the interval D from d1 to d2. Before the activity at time s, a concept of risk must express consequences in deviation from a normal state in the interval of D (Aven 2014).

Consequences of future activities at time s are not known and this is where the conceptual use of risk perspectives can affect risk communication. s defines which part of the assessment can be regarded as history and which part regarded as future. If d1 = s, attention to the future interval is s = d2, probabilities can be used to express the analyst's uncertainties. These uncertainties are associated with the assessor's risk perspective and will thus affect the risk assessment and the risk communication.

Experts argue that a risk analysis is an assessment conducted by a someone with a given knowledge, but new knowledge (or a new someone) could change the situational awareness of risk. Newspapers often publish expert comments and expectations of future events. «Naive positivists» claims facts to be the only object of knowledge (Aven, 2007). Considered as an arrogant method for experts to relate risk to historical data, «naive positivists» argues that one need empirical evidence for knowledge and that one can have no knowledge of risk without no such (Aven 2007, «risikostyring» p - 54).

Illustration of knowledge and options in risk communication related to the time dimension is illustrated in figure 2. At time s, we will have a span of options to mitigate risk and/or consequences, however, there is little knowledge of the situation. At time d1 (somewhere between s and d2) we will have new knowledge about the unwanted event. This knowledge also proves insight to what risk mitigating factors we had optional prior to the event, but as consequences already have made an impact, fewer options of risk-mitigating factors are now possible. We are left with more knowledge but fewer options.

Exchange or sharing risk-related data, information and knowledge between stakeholders in order to identify possible scenarios which coincide with the nature of its habitat can thus contribute to establish situational awareness and knowledge and to identify risks and possible consequences (Aven, 2007). To identify risk mitigating factors or black swans, a risk assessment should, therefore, be founded in a proactive perspective, in the interval D from d1 to d2.

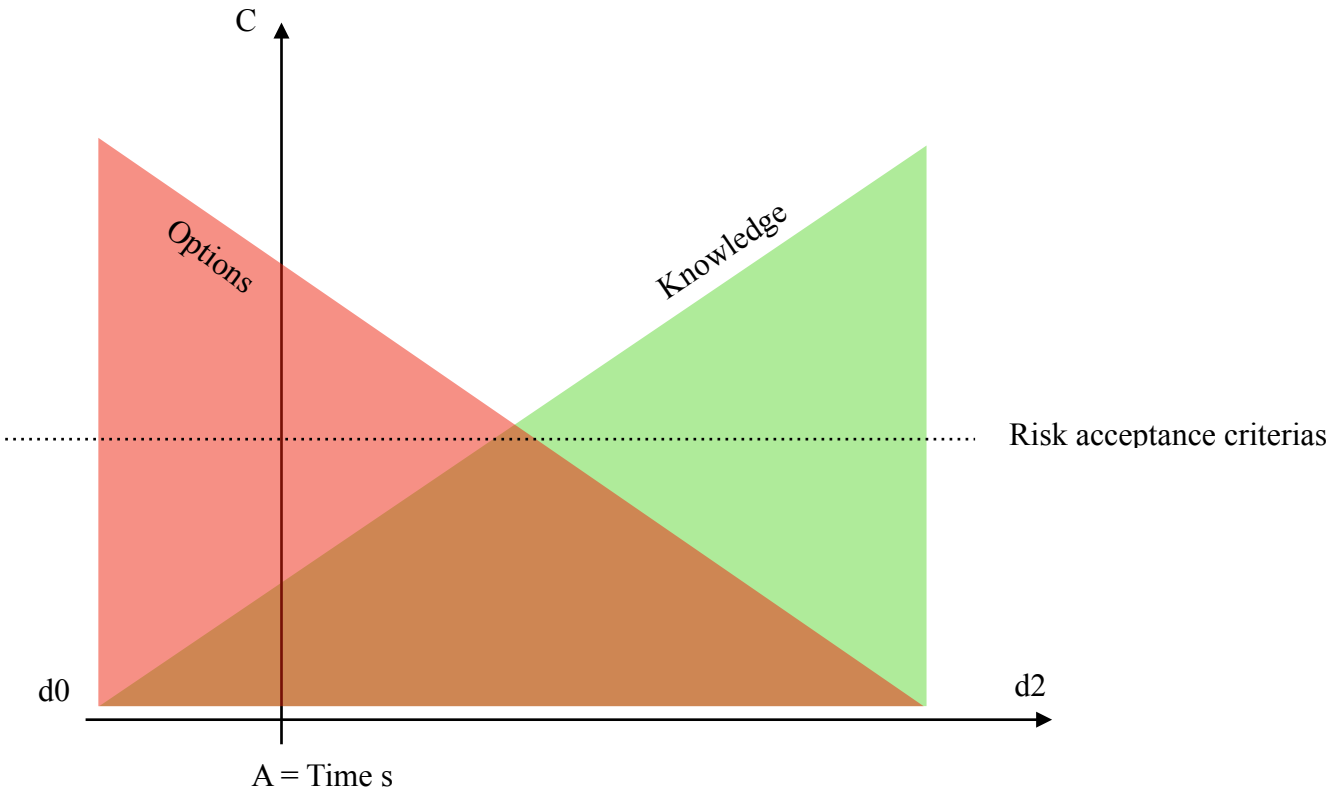


Figure 2: Illustration of knowledge and options in risk communication related to the time dimension: Red illustrates the span of identified risk mitigating factors in the event of A, while Green illustrates the span of knowledge = d2 in relation to Consequences C = s in the event of an unwanted event A. The risk acceptance criteria are predefined values set as a limit for an unwanted state.

2.3.3 Risk Acceptance criteria

Risk acceptance criteria define a pre-defined value which represents the line between acceptable and unacceptable risk (Aven, Røed and Wiencke 2008).

2.3.3 CCost-Effectiveness, Cost-Benefits, and decision-making principles

A risk is about the future and is therefore associated with uncertainty (Aven, 2007). When making decisions, it is therefore not always possible to access all information. When dealing with new substances eg. nanomaterials, or when the situation is unfamiliar with eg. a new vaccine, a decision could have consequences beyond the horizon. Decision-making principles are often used as a policy when it comes to such circumstances. A cost-effectiveness analysis compares the relative effects of the relative costs and outcomes of different possible courses of action. The analysis is distinct from a cost-benefit analysis which is a systematic approach to estimating the strengths and weaknesses of alternatives to the risk assessment (Aven, Røed and Wiencke 2008).

In the white paper of NOU 2016:19, cost-effective regulations are ensuring a balance between acceptable residual risk and the cost of the security level. Socio-economic profitability should be a basic prerequisite, ie. «current hedging measures must have a socioeconomic benefit that together exceeds the cost».

An organizations commitment or policy to decision-making principles for risk management is often linked to a risk management system and could hold a consensus when addressing a perspective of risk. If considering associated uncertainties to a cost-effectiveness or a cost-benefit analysis, decision-making principles as the cautionary principle, the precautionary principle or the ALARP principle may support the decision maker. d2

The cautionary principle implies a cautious approach as the dominant principle when uncertainty is associated with consequences of the state or action and is regarded as an operationalization of the precautionary principle (Aven, Røed, Wiencke, 2008). The precautionary principle means to avoid or abort activity if there is a lack of sufficient scientific consensus to the consequence (Aven, Røed, Wiencke, 2008).

ALARP («as low as reasonably practicable»), means reducing the risk to a level as low as practicable. The understanding of the level «as low as practicable» is defined as a «gross disproportion» between the cost of implementing safe barriers or alternatives, and the disadvantage and effect (cost-effectiveness). The principle Implies a reversal of the burden of proof, meaning that identified measures shall be implemented unless a gross disproportion can be documented (Aven, Røed, Wiencke, 2008).

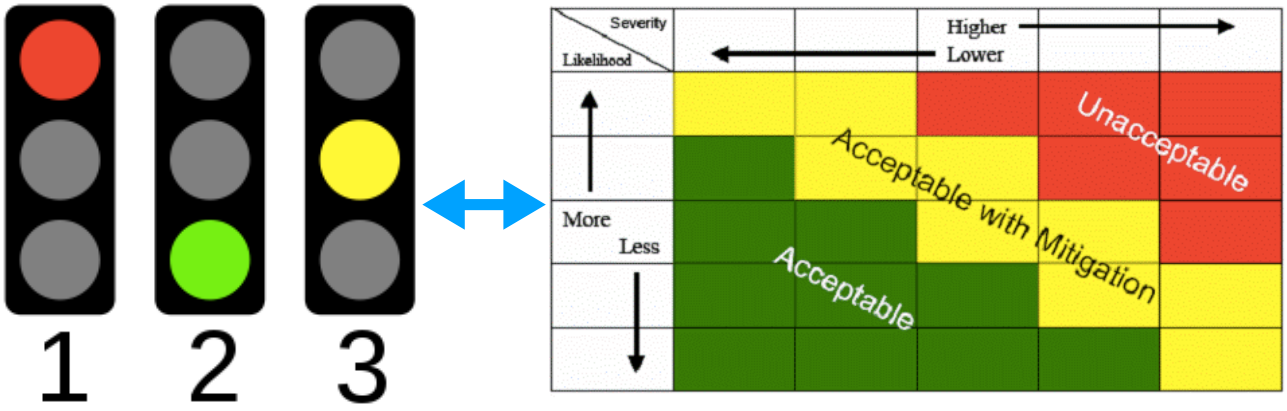
2.3.4 Color terminology

Risk communication deals with communication of a risk assessment before a potential event or crisis. Crisis communication is after the event has occurred or during the crisis (DSB, 2016a). By theory, risk communication is understood as the exchange or sharing risk-related data, information and knowledge between stakeholders (Aven 2014, p.234).Other definitions of the concept are known as the exchange and sharing of risk-related data, information, and knowledge between and among different groups, such as professionals, authorities, consumers, the media and the general public (Store Norske Leksikon).

The purpose of risk communication is to alert the recipients of possible risks and change behaviors so that these events do not occur or the negative consequences are reduced (kommunikasjonsforeningen 12.06.14). From a risk manager's perspective, the purpose of risk communication is to help residents of affected communities understand the processes of risk assessment and management, to form scientifically valid perceptions of the likely hazards, and to participate in making decisions about how risk should be managed. Risk communication tools are written, verbal, or visual statements containing information about risk (Questionnaire; Guidelines, Appendix B).

A (Boston square) risk matrix is a tool to communicate risk categories (Aven 2007). If a risk matrice includes values which are not self-explanatory, the results of the risk analysis and recommendations to a decision maker could change, dependant on the values of the matrices (Aven, Røed and Wiencke, 2008). If used right, a risk matrix is sufficient to present an overview of the risk picture in terms of possible consequences and associated probability/frequency (Aven, Røed and Wiencke,

2008), however it is important to understand that a risk matrice must communicate the methodology behind the risk assessment and also the risk acceptance criteria. In terms of practical use, risk management and risk communication are complicated without both practical and theoretical experience. Knowledge about how risk perception may affect decisions is, therefore, a prerequisite for successful risk communication within and between strategic and operational levels of preparedness (Aven, 2007).

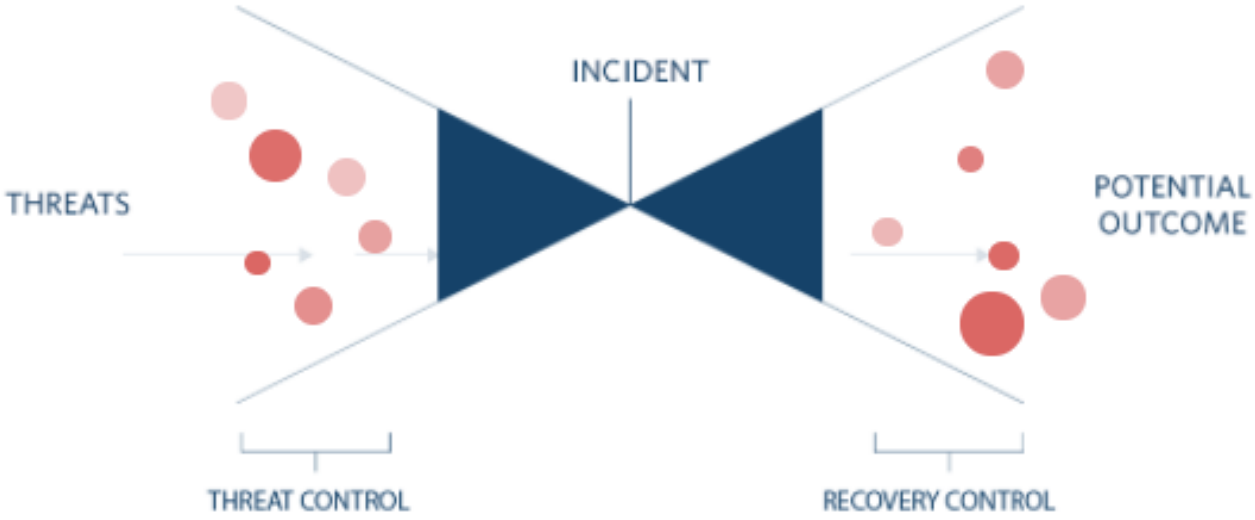


Picture 1: Traffic light color regime (right) vs a risk matrix with risk acceptance criteria in colors (left).

A vulnerability in the traditional risk matrices can be the use of colors because the use of a color regime could draw to assumptions. When people are confronted by colors in a decision making, a study showed effective responses to color perceptions of risks and benefits which in turn influenced risk-taking (Weber, Blais and Betz 2002). The uncertainty of who sets the risk criteria (in this case criteria for the color regime) and what scientific approach the criteria are based on, is someone's uncertainty based upon their knowledge (Aven, 2012). If the analyst or the decision maker has no scientific foundation in their understanding of risk, the prerequisite for reflecting key information is lost and thus color perception could affect decisions.

In picture 1 we see a traffic light regime and a traditional risk matrices with the traffic light colors regime (red, yellow and green). The values in the traffic lights (1,2,3) compared to the color regime is not self-explanatory as the appearance of colors differs from the ranking order of appearance of expected values in the matrix (red regarded as a high risk = high value, orange as a medium risk= medium value etc.). If the colors in the matrices refer to a value as an assigned probability, possibility or likelihood, the meaning and the scientific approach to this number must be explained in a way so that the decision maker has a full understanding of what this value represents and, most importantly, the scientific criteria for the valuation.

Another model used for assessing, analyzing and communicating risk, is the Bow Tie Model. A Bow Tie Model is often used to identify threats to an unwanted incident. The «bubbles» in the model represents barriers to prevent the threat to initiate the incident (threat control) or to reduce the potential outcome (recovery control). The Bow Tie Model establishes a risk picture with identified causes which represents a risk and compare options to their effects on the event (Aven, Røed and Wienke, 2008). This enables an option of alternatives in the planning phase, eg. cost-effectiveness solutions and helps to identify if measures (threat control/recovery control) are adequate or in compliance with regulations and their robustness with regards to the potential outcome.



Picture 2: A Bow Tie Model. (Picture: Norwegian Hull Club)

2.3.5 The concepts Probability, Possibility, and Likelihood

The words (terms) probability, possibility, and likelihood are often used as concepts in risk assessments as they are synonyms. In the Norwegian language, these words will translate to one word, the concept of «sannsynlighet». A central concept in the concept of risk is probability, in which might be interpreted differently (eg. like an actor's interpretation of the role of Hamlet) and thus affect the perspective on risk. The two most common interpretations are the relative frequency and the subjective probability theories (Aven, 2007). Maybe considered the classic interpretation is the relative frequency theory, where probability (P) indicates the frequency of action (A) in an infinite perspective. This is considered an objective risk approach, or a «true» risk perspective. In a frequentist probability, the expected value of variables is the infinite average value (a consequence) of repetitions of the experiment it represents.

In an infinite game of dice, the expected value (3.5) is an average of all the numbers. The Expected Value (EC) could be expressed as: EC =c1 x P1 + c2 x P2 + ….

A likelihood of a risk to occur can be expressed as a probability with a number between 0 and 1, with 0.0 = a situation will never happen, and 1.0 = a situation will always occur. With two scenarios, possibilities or likelihood can express a consideration of how much more one scenario is to occur than the other. If a probability is understood as a frequentist probability, the risk has to be estimated in a model concept. If the probability is considered a subjective probability, the possibility or likelihood would be based upon the belief from the assessor.

As there are many definitions and perceptions of risk, a mixed interpretation of probability in communicating risk, if organizations differ their dictionary definitions, or if an analyst or a decision maker holds a mix or various ideas of this concept, this can lead to misunderstandings and confusion (Aven, 2007).

In general, probabilities are understood as quantifiable values while likelihood and possibilities are not. This is an important issue when presenting risk assessments because individuals often fail to express levels of danger using probabilities (Aven 2007).

If the reference is based on objective numbers, and the probabilities they express is (often) affected by numerous factors as fear (Aven, 2007, «Risikostyring» p-56), the interpretation of risk could thus lead to communication of a perception which is not necessarily founded on scientific evidence or perspective, rather than just a «gut feeling».

2.3.6 An example of how different risk perspectives may affect risk communication

Risk management is based on risk assessments. In the modern society, resilient models are constructed to enhance capacity to resist, absorb, accommodate and recover from a potentially critical effect of hazards. Examples of such models are found in risk and vulnerability analysis or strategy documents. Civil preparedness is a chain of High-Reliability Organizations. The cliché of the weakest link is highly relevant in this chain of preparedness; if resilient models are built on the trust that a risk assessment is «true», it´s robustness could fail and the level of resilience might not be able to withstand the adequate stress.

In a sample from a survey published in a report from The Norwegian Directorate for Civil Protection (DSB), 57% of Norwegian municipalities corresponds that their public drain and water supply system are not designed to handle the expected rainfall of the future. 43% Norwegian municipalities correspond that their public drain and water supply system is sufficiently designed to handle the expected rainfall of the future. In Norway, concepts like «heavy rain», «storm rain», «extreme rain», «heavy rainfall» are used to each other to describe the phenomenon and the consequences of short-term intense precipitation (DSB, 2016b). In Denmark, a «cloud break» is defined as a short-lived, but very heavy rainfall, > than 15 mm rainfall of 30 minutes. In Sweden, the phenomenon is described «skyfall» of > 50 mm rain in one hour, or > 1 mm in a minute. In Norway there is no corresponding definition, however, discussions are ongoing within the Nordic climate cooperation on establishing a common classification system for different categories of heavy rainfall (DSB, 2016b).

From a uncertainty risk perspective, assuming the risk assessments from the Norwegian municipalities are made upon a «traditional» risk perspective R = P&C, how can we trust that the drain and water supply in the 43% cities are designed adequately to meet future extreme rainfalls if they have not expressed the presumption for their analysis? Due to the regional and local geographic conditions in Norway, heavy rain varies from < than 20 mm/ day to >150 mm/ day in the most precipitous areas in western Norway (DSB, 2016b). How probable is it that future rainfall will exceed (say) ~50mm/H in the regions where they experience <20 mm/ day today, and (how) are the uncertainty to these probabilities expressed by the representative municipalities?

Recently, Scandinavian cities have experienced heavy rain with >60mm/H. In 2011 Copenhagen experienced a heavy rainstorm with >130mm rain which flooded vital infrastructure. The rainfall exceeded the 55-year-old record and paralyzed the city for days. The city had never been tested to withstand such deluge, which caused effects to the modern society´s complexity and tight couplings. Water drainage is an important task to civil preparedness, as negative consequences are associated with flooding, blocking of infrastructure, hampering civil authorities and polluting drinking water. If operating with figures with probabilities of rain (say) < /~50mm/H, 43% of Norwegian municipalities communicates that their public drain and water supply systems are sufficiently designed to handle the expected rainfall of the future.

This could give a false impression of preparedness if the uncertainty in the assessment is not properly understood. In a political system, as in politics, cost-effective policies could budget less money to civil preparedness measures to handle flooding and extreme rainfall if they are based on a false or «wrong» perception of safety and/or security. The subdimension of consequences is less equipment, assets, training, and preparedness to handle consequences of heavy rainfall.

2.4 Risk communication models in light of associated risk perspectives

This chapter presents tables upon the effects of risk communication in light of different risk perspectives (Veland and Aven, 2014). The tables summarize Veland and Aven's main findings in how risk assessments can be perceived in the light of the different risk perspectives in the analytical framework.

2.4.1 A risk analyst presenting the result of a quantitative risk assessment to a decision maker

Situation	Analyst	Decision maker	Effect
Both actors have a chaotic risk perspective	The analyst will fail in communicate the message of the assessment.	The decision maker will fail in entrepreting the values in the assessment.	The assessment have no scientific founding or a mix of various ideas about the concept. Terms, concepts and quantities are not properly understood by both actors, and there is no tool to intrepret values.
The analyst has a chaotic perspective, the decision maker have an objective, uncertainty or non-probabilistic perspective	The analyst fail to express associated uncertainty in the assessment	The decision maker do not recieve a comprehensive risk assessement	The analyst tries to simplify and avoid to discuss uncertainties and thus miss an vital element of the risk assessment.
The decision maker has an objective perspective, the analyst the uncertainty or non-probabilistic perspective	The analyst presents the scientific perspective of the assessment	Expectations about an objective risk raises doubt to the validity of the assessement	The analyst and the decision maker have opponing perspectives and debates approach to risk assessments.
The analyst has a non-probabilistic perspective and the decision maker the uncertainty perspective	The analyst fail to present the scientific perspective in the assessment	The decision maker do not understand the methology for the assessment	The decision maker is affected by findings in the assessment

Table 2: A risk analyst presenting the result of a quantitative risk assessment to a decision maker

2.4.2: An expert providing risk related input to an risk analyst

Situation	Expert	Risk analyst	Effect
The expert has a chaotic risk perspective, the risk analyst have an objective, uncertainty or non-probabilistic perspective	The expert will fail in communicating risk in the assessment.	The analyst identifies the chaotic perspective and systemizes the risk assessment	The communication might cause mistrust and problematize collaboration
The expert has a chaotic risk perspective, the risk analyst have an objective or non-probabilistic perspective	The expert will fail in communicating risk in the assessment.	The analyst gets distracted by objective or frequency based probabilities and neglets uncertainty	The communication might cause mistrust and problematize collaboration
The expert has a chaotic risk perspective, the risk analyst have a risk perspective in which uncertainty is the main component	The expert will fail in communicating risk in the assessment.	The analyst identifies the chaotic perspective and systemizes the risk assessment	The analyst has a conceptual risk approach that the expert do not understand
The expert has an objective risk perspective, the risk analyst have an uncertainty based perspective	The expert succeeds to communicate an objective («traditional») risk assessment	The analyst questions the validity of the assessment by identifying uncertainties	The communication debates the conceptual understanding of risk and cooperation require the expert to add values to subjective probabilities

Table 3: An expert providing risk related input to an risk analyst

2.4.3: A risk analyst presenting results of a risk assessment to lay people

Situation	Analyst	Lay people	Effect
Both actors have a chaotic risk perspective	The analyst will fail in communicate the message of the assessment.	Vulnerabilities in the assessment will be questioned and criticised	The assessment would raise criticism and mistrust and raise opponement within lay people
The analyst has an objective risk perspective, lay people have a risk perception perspective	The analyst perspective presentes a risk assessment built on a «true» risk based on frequentist probabilities	Lay people conspire perceptions not included in the assessment and fear unpredictability	Public criticism and the analysts risk perspective rise barriers to risk communication
The analyst has an uncertainty risk perspective, lay people have a risk perception perspective	The analyst perspective presentes a risk assessment weighting the uncertainty and reflecting knowledge	Lay people wary the uncertainty perspective but rise attention to the knowledge in the assessment	Depending the analyst ability to communicate, lay peoples knowledge of uncertainty could build trust to the assessment

Table 4: A risk analyst presenting results of a risk assessment to lay people

2.4.4: A decision maker communicating a risk related issue with lay people

Situation	Decision maker	Lay people	Effect
The decision maker has an objective risk perspective and lay people have a chaotic or risk perception perspective	The decision maker limits the communication to the result of the assessment, trusting that the «true» risk justifies the decision	Lay people can either trust or mistrust the decision maker	The basis for a dialogue is poor if the decision maker trusts the assessment as a «true» risk. Risk mitigating will be retrospective measures.
The decision maker has an uncertainty risk perspective, lay people have a chaotic or risk perception perspective	The decision maker focuses on the uncertainties in the assessment	Lay people can either trust or mistrust the decision maker	Without a scientific knowledge the decision maker could easily fail to communicate the uncertainty perspective as a trustworthy assessment

Table 5: A decision maker communicating a risk related issue with lay people

3. The research design

This chapter describes the research design, why data has been identified as relevant and how it has been analyzed.

The Master of Science program in risk management at the University of Stavanger has inspired the theoretical foundation. The theory is founded on professor Terje Aven´s et.al. approach to risk in «Risikostyring» (2007) («Risk Management»), Terje Aven et.al (2008) «Risikoanalyse» («Risk Analyzis»), Aven et.al (2007) «Samfunnssikkerhet» («Civil Protection») and «Risk, Surprises and Black Swans» (Aven, 2014). Most importantly, Veland and Aven´s (2012) article on «Risk communication in the light of different risk perspectives» has founded the theoretical approach to the thesis research question.

Despite the broad emphasis on a common understanding of concepts and definitions in civil preparedness, no relevant research relevant to (effects of) risk perspectives in naval cooperation or civil preparedness was found. Initially, in the shaping of the research question, the Norwegian Institute for Defence Studies (IFS) was contacted to confirm the relevance of the question. Rear Admiral Gade (ret.) of the Royal Norwegian Navy, and Associate Professor and author of «Maritime Security and International Order at Sea in the Arctic Ocean» (2016) Katarzyna Zysk had no knowledge of such studies but they both took interest in the subject.

At a seminar arranged by the Norwegian Institute for Defence Studies (IFS), I also had the opportunity to discuss the relevance of the research question with Heather A.Conley (Center for Strategic and International Studies (CSIS), Senior Vice President for Europe, Eurasia, and the Arctic; and Director, Europe Program). The general interest of the subject encouraged me to contact the Norwegian Defence Research Establishment (FFI). Through an initial meeting with a presentation of the framework for the thesis and the research question, FFI offered co-mentoring and guidance in the working progress.

To investigate the research question, different sources have been subject to exploration. Open NATO publications as the ATP-02 (vol.I), considered a standard publication onboard merchant ships, might be unknown to eg. the police. As opposite, organizations outside the police might not consider the Police Emergency Response System (PBS 1) relevant. However, when planning and executing preparedness measures, knowledge of collaborating strength and weaknesses is relevant. To investigate prominent risk perspectives in the different organizations, these publications may contribute to identifying differences in risk perspectives and are therefore represented in the document study in the three-layer model (figure 3). The three-layer model visualizes the process of associating prominent risk perspectives through a questionnaire, document studies and theoretical risk perspectives in the analytical framework.

The cybernetic model (figure 4) presents the process of the document study when associating risk perspectives to the analytical framework. The model represents how´s and why´s the process of studying the organizational definitions, procedures, guidelines, and communication has been considered relevant to the research question. A cybernetic model is often used in examples when identified deviations within organizations working process, can be corrected by implementing measures to close «gaps» and unwanted conditions.

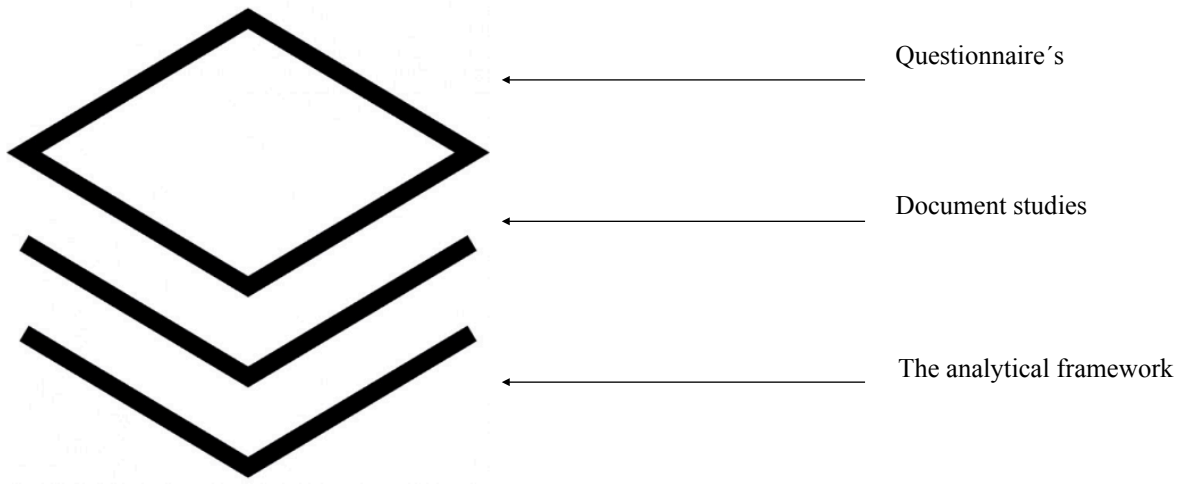


Figure 3: Research design; three layers used to analyze and connect risk perceptions to the five risk perspectives

The figure 4 shows how input (eg. standards, procedures, regulations) forms the organizations working process and how this affects the organizations' product (risk communication). To monitor this system, we need a sensor in the organizations' output, (product). The sensor sends measurements to an «analyzer» that compares the data with a set of predefined standards, («benchmarks» the five risk perspectives).

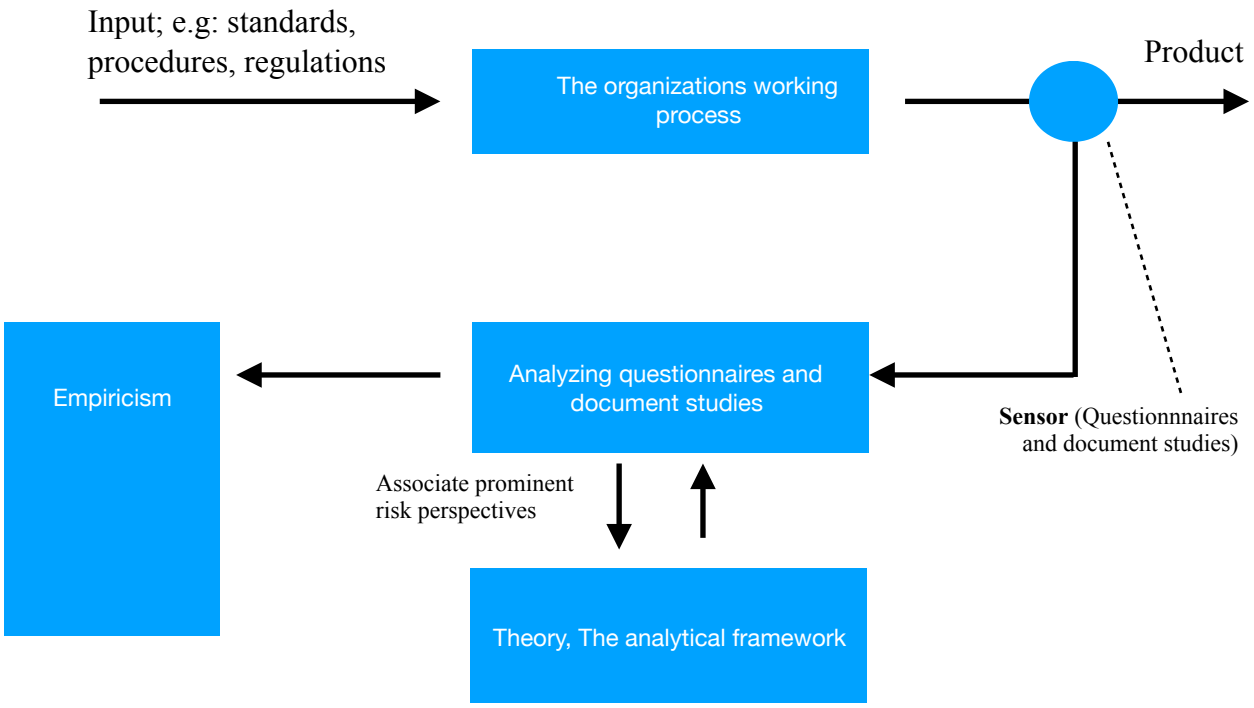


Figure 4: The cybernetic model used to associate the organization adherence to the five perspectives on risk.

In the qualitative approach of the methodology, the Norwegian National Research Ethics Committees in Norway have an explanation of similarities and differences in qualitative and quantitative models; When the purpose of the research is study of action patterns and interaction, what is happening in a given context, there are usually qualitative models that are used.

There are many ways to conduct qualitative research. Because of the geographical location of the different organizations, interviews and observations would imply extensive traveling and access to classified or restricted facilities, all over the country. For this reason, a questionnaire (Appendix C) was chosen as the most convenient way to approach the organizations. The three-layer model (figure 2) compares theory, the questionnaire, and the document studies. This is defined as the organizations' product which is processed in the cybernetic model.

The disadvantages of using qualitative methods are, among other things, that solid conclusions cannot be drawn (Tjora, 2010). The sample in the assignment is too small for the result to be generalized as only a few individuals have been respondents for the organization as a whole. On the other side, as long as the organization holds a formal and official definition of a concept, any employee could be able to communicate a definition in a formal correspondence such as a questionnaire.

Then again, the validity of the data is vulnerable to the recipient's knowledge of the strategic management of the organization. Also, the validity of the data in the collection may depend on how the meaning of the question was made concrete to the interview object. In some occasions, some of the recipients found telephone conversations necessary to clarify questions to the questionnaire. A typical question from recipients was made to the first question («How do you define risk?»): «what do you mean by risk? - do you mean HSE risk or security risk?».

This example of confusion to the questionnaire could be justified in the Norwegian concept of HSE (Health, Safety, Environment), where risk is often associated with the `S´ which in Norway traditionally has been subject to the HSE concept of Safety Management, not Security Management. In these conversations, there was a focus and sensitivity of not leading the interview subject to presumptions of a correct answer, rather than trying to lead the person to explain and discuss risk in their own words. This example of a need to clarify the definition of risk could also imply that the scientific knowledge of risk was poor, and therefore the relevance of the question could be justified.

In these conversations, precaution was made in order so that the recipients did not feel observed. When studying organizations, observing processes are considered more relevant than how employees will explain it, because observation may contribute to change of behavior in the process and thus affect the research (Tjora, 2010). Thus, data analysis was found more relevant than observation. To motivate the interviewees' answers to the questions not too evasive from the truth and to protect themselves for what he/she might consider as a strategically correct answer, the answers are associated with the named organization in the thesis and all person names are anonymized.

A good way of limiting the inherent uncertainty in the institutions' questionnaire answers, was in also examining the surrounding documents which are not necessarily linked to the institutions, but which offer alternative understandings and a backdrop to some of the answers. This is pertinent to answering how differing risk perspectives affect risk communication because it provides both documentary evidence and context for the perspectives. The document studies have been conducted

through open sources, publications, articles, and media such as newscasts. Such data represents social situations of the investigated organizations and adds a dimension to the layers of «questionnaires» and «document studies» in figure 3.

In how to interpret and analyze qualitative data, observation is the best way to evoke knowledge of the intersubjective construction of reality, because observations force us to listen to what the world tells us (Tjora, 2010). In studies of organizations, observing processes are more relevant than how an individual will explain it. This might call for a contradiction because even though the questionnaires are intended to represent the perspectives (and perception) of the organization, the answers are ultimately explained by individuals. Thus, to avoid a personal (subjective) perception to the answer, the question was formulated as a definition of a concept, not a perception («How do you define risk?»).

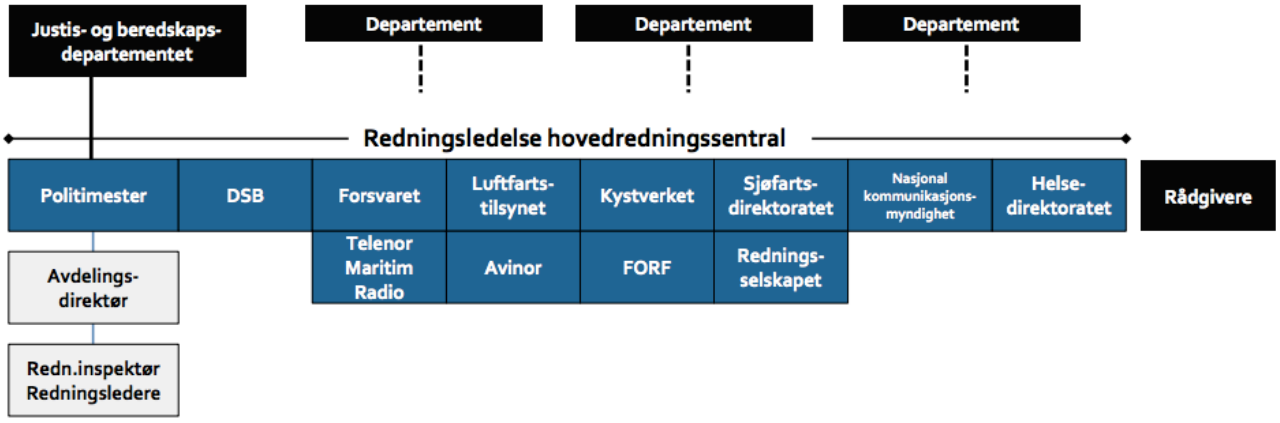
An implication of the research question is that those different risk perspectives within, and cross-institutional between organizations with roles and tasks to naval cooperation, could lead to poor communication, misjudgments in planning and immature and/or prejudicial execution of risk mitigation in both top and bottom levels organizational. Another, maybe less obvious, implication, is that any differences in risk perception are intentional and developed in a «Darwinistic» nature, and that the prominent perceptions are adapted to a functional symbiosis within these organizations over time, and that there are associated negative consequences by changing the risk perspectives.

3.1 The selection of organizations

The research topic is to associate prominent risk perspectives to the organizations with roles and tasks in naval cooperation. The task has chosen to expand the investigation to include their main organizations. For example, the Norwegian Defense University College will have influence in the Norwegian Joint Head Quarters or the Coast Guard through their education system. The Directorate of the Police designs guidelines and standards for the police. The police departments communicates risk assessments to eg. the armed forces. In NATOs doctrines (ATP-02.01), Cooperation with actors in the civil preparedness and good cooperation with civilian actors is of outmost importance. Units on different levels are given orders to cooperate with their civilian counterparts, and all units at all levels are encouraged to be proactive in this process. Thus is how the organizations use concepts and definitions internally also of interest to the research question.

The selected organizations with roles and tasks in naval cooperation which are subject to investigation in this thesis are:

- The Norwegian Ministry of Justice and Public Security with subordinate divisions
- The Norwegian Coastal Administration with subordinate divisions
- The Royal Norwegian Ministry of Defense with subordinate divisions
- Central Maritime Organizations



Picture 3: Example of how the selected organizations cooperate. The picture shows the organizational chart for the Joint Rescue Coordination Centre (Hovedredningssentralen).

3.2 The Questionnaire

The questionnaire (Appendix C) were sent in April 2017. In some occasions, the recipients delegated the answers in their internal document handling systems, and in one occasion the document handling system did not register the questionnaire as a subject to reply. The last questionnaire was re-sent and received in September 2017. Of 16 recipients, one recipient rejected to publicise their definition of risk. In most circumstances, the recipient took interest in the subject and contributed to associate a prominent risk perspective within their organization.

The questionnaire was sent to the representative organizations at their strategical, operational and tactical levels (eg. from the Ministry of Defense to the Coastguard). The purpose of the questionnaire was to gather data that would help answer the research question. The questionnaire sent to the different organizations had three questions with guidelines.

A questionnaire is probably the most common scientific method for gathering data. The physical distance between the recipients and the fact that some of the recipients are located with restricted access was an important aspect of choosing a questionnaire. The questionnaire introduced the research question and placed risk in a context.

For interview and observation, Marshall and Rossmann (2006) have the following subdivision of the relationship between research topics and method selection: Qualitative research interviews should be open, not standardized, and interview studies can be based on data from individual interviews or group interviews. For investigating risk perception, if the purpose of the research is to gain insight into the experiences of individuals and their own interpretations, this data is collected through interviews, verbal or written.

To send an unstructured questionnaire was considered an informal way of letting the recipient reply in their own premises. If the purpose of a study is to study perception, it is important to choose a design that can give access to this type of knowledge. Observations through an unstructured questionnaire and internet-based generation of data is a way of observation which might produce

more relevant empiricism than interviews (Tjora, 2010). The qualitative approach of such observation can provoke a creative diversity which might reflect contextual circumstances in the organizations. The intention of this is not to provoke a «correct» or «wrong» perspective of risk, rather than to identify which risk perspectives that are prominent in and between the organizations which are intended to cooperate.

The representative organizations are large and complex. Some organizations responded within days, while others through gentle reminders spent months to their reply. Despite attempts to find a person of contact in some of the largest organizations, the questionnaire in some occasions was passed on internal within the organizations, but with no clear responsible point of contact. Although this might have happened, the questionnaire has asked for the organizations' definition, and not a personal (subjective) opinion and should ideally be answered upon by a general request. The representative recipients are considered those who hold a relevant role, position or function in the respective organizations, such as senior officers, senior advisors or head of departments, and all replies have been signed by such titles.

The guidelines in the questionnaire and the fact that every recipient received the exact same question are intentional, to evoke a clear and comparable answer to the questions. However, the answers appear different in the approach of the concept of risk, from clear and concise, to interpretable information.

It is important to note, that the thesis investigates risk perspectives and risk perception of the selected organizations, not the answer from the individual subject to represent the organization. This has also been clarified in telephone calls with the recipients. The data analysis represents the participants' definition of risk with either a formal definition, but also taken into consideration that a recipient might use his or her own words to describe risk («sensor», figure 3: cybernetic model).

What people do and what they say they do can be two different things. A process, formal or informal, might represent an opposing perspective to statements. Similarly, interview data may say something about attitude or perception of a concept that is not possible in an observation study (Tjora, 2010). The questionnaire´s unstructured design means that it holds an open question in which the respondents must present their definition by words. A definition is understood as a statement of the exact meaning of a word, while perception is understood as the way in which something is regarded, understood, or interpreted (Merriam-Webster dictionary). It is often reflected in the way we do things, in formal or informal procedures.

With the first question, a definition leaves no room for interpretation of the exact meaning. This holds the presumption to the question that the organization has a definition of the concept. If the organization holds no definition of the concept, or if this is unknown to the responsible recipient, the following questions open for a consensus for a perception of the concept.

The second question asks for formal procedures of risk management, while the third question asks how risk is communicated. To place risk in a context, we try to communicate a benchmark, risk accepts criteria and risk mitigation, as a measurement of deviation from a normal state or from what is considered an expected value. Means of communication from document studies are studied with reference to the example of risk communication in chapter 3.6. The intention of question 2 and 3 in the questionnaire, is to add consensus to the empiricism in the questionnaire layer of the three-layer model.

The population of the recipients to the questionnaire is small. Despite the question for an official definition, one cannot ignore the dependency of the recipient's organizational knowledge. The representative organizations are large and complex and some divisions are manned 24 hours 365 days. Some organizations are based upon rotation of shifts and some might be new to their positions. Though the questionnaire is intended to identify the organization's prominent risk perception, answers are necessarily not representative for the organization as a whole or for sub-organizations or subdivisions, operational assets or crews within the different organizations subject to investigation. If there is no formal definition of risk within the organization, or if this is unknown to the recipient, a subjective opinion of the concept might have influenced the answer.

The process of analyzing associating prominent risk perspectives within the respective organizations is founded in the three-layer model. The questionnaire forms the basis for the data analysis.

Where references to data have been made in the questionnaire, this data has been studied. If the recipient has no references, public documents, literature and/or seminars are used as a source for the document studies. The questionnaires are presented as direct transcripts or direct translations, all approved by the recipients.

3.3 Document studies

Document studies, studies of documents which are normally produced for other intentions than research (Tjora, 2010), are in this context case specific to the risk concept. Due to the enormous proportions of available data, only a limited selection of documents has been analyzed. The selection has focused on official reports or documents such as governmental white papers, official reports or the most recent news and articles.

An article is an example of a data source with a potential agenda or politics which could influence an objective perception. An example is a homepage of «aldrimer.no» is an independent journalistic project, but its agenda is to raise awareness about Norwegian defense policies, capabilities, and foreign affairs related to its total defense. This holds an example of how the validity of data in the document studies can be questioned. Use of additional data to confirm the validity of the empiricism is an example of redundancy in cybernetic the model.One of the methods for collecting data has been through reading articles and public documents. Such documents, articles, and reports found on the internet have contributed to the research question relevance.

In 2016, an amendment was made to the National Crises Response Manuals[1] in the Norwegian Maritime Tactical Instructions and Procedures (NOMTAC) [2]. This amendment describes roles and tasks for national Implementation for Naval Cooperation, emphasizing the roles and tasks for each organizations implementation of Naval Cooperation in crisis and conflict (Meld. St. 13 (2015–2016)) to the following actors which are subjects of investigation in this thesis.

The National Crises Response Manuals and the NOMTAC procedures are excepted publicity. To avoid compromising classified information in the amendment made to the National Crises Response

[1] The National Crises Response Manuals for the Armed Forces, «Nasjonalt Beredskapssystem for Forsvaret» (BFF), and the National Crises Response Manuals for civil protection, «Nasjonalt Beredskapssystem for Sivil Beredskap» (SBS)

[2] NATO Doctrine STP 50 (C)

Manuals for National Implementation Naval Cooperation and Guidance for Shipping (NCAGS), these publications have not been subject to investigation nor are they discussed in this thesis.

All presented data are from open sources. Documents such as the NATO standard ATP-02 series, the Police Preparedness System 1 (PBS1), Tactical Maritime Planning Manual for the Navy (TAMP), Military Doctrine for the Navy, are unclassified documents. However, these documents are not easily accessed without proper knowledge of their existence.

3.4 Other information sources

Three seminars have been attended. The seminars provided relevant knowledge and justification to the research question:

IFS Seminar: 08. March 2017, Oslo:

The Norwegian Institute for Defence Studies (IFS). IFS's main activities are concentrated in the areas of research, teaching, and dissemination. The institute is Norway's foremost center of security and defense studies (IFS). The seminar´s main topics were:

- NATO and the North Atlantic - Revitalizing Collective Defence»
- Security Challenges in the North Atlantic Norwegian

IFS gathered military leaders and security experts from the United Kingdom, the United States and Norway to discuss security, military posture, and cooperation in the North Atlantic. This seminar included a panel debate with the authors of the book «NATO and the North Atlantic - Revitalizing Collective Defence». The message of the publication is that the importance of the total defense concept is vital to the alliance, and open sea lines of communication is a prerequisite for NATO to fulfill its obligation to aid Norway in an article 5 operation.

NCAGS Seminar: 29. May - 01. June 2017, Bergen:

As an NCAGS officer, I was invited to the seminar with a «Review of Updated NCAGS Policy (MC376/3) and updated NCAGS and AWNIS doctrines». The seminar was held at Camp Ulven and its main topics were:

- New Organization of NCAGS / AWNIS Command and Control Structure
- Further Development of NCAGS / AWNIS
- Technical Tactical Procedures (TTP´s)
- NOMTAC

Aldrimer Seminar: 21. September 2017, Kristiansand;

Place: Offisersmessen Gimlemoen, Kaserneveien 26, Kristiansand
Topic: How Aldrimer.no works with critical journalism in relation to the Armed Forces and Civil preparedness
Lecturer: Journalist Ole Dag Kvamme, aldrimer.no

4. Empirical data

This chapter presents the empirical data of the thesis consistent with the three-layer model in the research design.

The research topic is to associate prominent risk perspectives to the organizations with roles and tasks in naval cooperation. The thesis has chosen to expand the investigation to include their main organizations. In order to answer the research question, an examination of the risk perspectives of each institution is required. The institutions' answers to the questionnaire make up a portion of this data and are summarised below.

- The Norwegian Ministry of Justice and Public Security with subordinate divisions
- The Norwegian Coastal Administration with subordinate divisions
- The Royal Norwegian Ministry of Defense with subordinate divisions
- Central Maritime Organizations

Chapter 4.2 examines the referenced documents, including surrounding documents which are not necessarily linked to the institutions. This is pertinent to answering how differing risk perspectives affect risk communication because it provides both documentary evidence and context for the associated risk perspectives. Chapter 4.3 presents a table summary of the associate prominent risk perspectives.

4.1 Questionnaires

The Norwegian Ministry of Justice and Public Security sector

Overall responsible for nine departments, the main purpose of the Ministry is to provide for the maintenance and development of the basic guarantees of the rule of law. An overriding objective is to ensure the security of society and of individual citizens (Regjeringen.no).

The Ministry´s 2015 goals for the civil security and emergency chain focused on a reduced vulnerability in the society by strengthening cooperation in crisis management through knowledge-based prevention and better management and management culture. (Regjeringen.no) The Police Department and the Directorate of the Police are subordinated the Ministry of Justice and Public Security.

4.1.1 The Ministry of Justice and Public Security

The Ministry of Justice and Public Security do not give a clear definition of risk but reference to a definition of risk in the white paper of Kgl Res. By 15.06.2012. The white paper states the ministries' work on social security and preparedness, holding each department responsible for social security and preparedness within its own sector. The ministries have a responsibility to coordinate social security and preparedness work in their own sector with the work done in other ministries. Work on civil security and preparedness should be targeted, systematic and traceable and be integrated into the ministry's planning, management systems and in the governance dialogue with underlying businesses (Kgl Res. By 15.06.2012, Chapter IV). Among the amendments, the ministries shall:

§1. Based on an overview of risk and vulnerability in the own sector and DSB's (the Norwegian Directorate for Civil Protection) national risk picture, assess risk, vulnerability, and robustness in critical social functions in their own sector as a basis for continuity and contingency planning and appropriate exercises. It will be systematically worked to develop and maintain the overview.

Operationalization of risk management in civil security and preparedness is further described (Kgl Res. By 15.06.2012, Chapter V) - Coordinating role of the Ministry of Justice and Public Security: *«In the civil sector, the Ministry of Justice and Public Security has a general coordination role for civil security and preparedness. Through its coordination role, the Ministry will ensure coordinated and comprehensive work on civil security and preparedness across sectoral boundaries»*.

The DSB supports the Coordination Role of Justice and Emergency Affairs in accordance with Royal Decree. June 24, 2005, No. 688. Among the amendments, the Ministry of Justice and Public Security shall review status and promote social security and preparedness work by:

§1e) Facilitate DSB's national risk picture as a basis for the work of the departments with civil security and preparedness.

Meld. St. 10 (2016–2017) «Risk in a Safe and Secure Society» white paper states that civil security requires coordination and cooperation across sectoral boundaries and between authorities at local, regional and central levels. A vigilant and risk-conscious culture is considered important, the daily contingency, through learning through exercises and events is crucial for success, and good planning and good practices are the foundation of preparedness efforts. The white paper acknowledges that «it is likely that the unlikely will happen, and It's economically and practically impossible to remove all risk». Furthermore, the white paper´s chapter 11 comments that understanding of concepts or knowledge of each other's conceptual use is a prerequisite for understanding each other and being able to interact, whether it is in events or in other contexts.

The Meld. St. 10 (2016–2017) white paper chapter 13.6 discusses the use of concepts more closely. Box 3.3 in chapter 13.6 contains an overview of some key concepts and how they are used in the white paper, whereas the risk is defined as «A product of the probability of an event occurring and its consequence if it occurs». This is associated with the definition of probability and scenarios/ consequences/severity of consequences (R = P, C) (Appendix A, Veland, and Aven (2012), Aven, 2012), and thus associates with an objective risk perspective.

4.1.2 The Directorate of the Police

The Directorate of the Police is a government agency under the Ministry of Justice and Public Security and is the top management level in the police. The Directorate is responsible for the development of the agency, both as a governing body and competence center. The Directorate provides qualified assistance and support to the police districts, special bodies, the Justice and Emergency Department and other partners through active assistance, resource coordination, method development, and management and competence development (regjeringen.no)

Stated in the questionnaire, the Directorate of the Police holds no formal definition of risk. They do refer to an adherence to the definition of risk in the white paper of Stortingsmelding nr. 10 (2016-2017) «Risk in a safe society», where risk is defined as: «A product of the probability of an event occurring and its consequence if it occurs». This is associated with the definition of probability and scenarios/consequences/severity of consequences, expressed (R = P,C) and thus associates with an objective risk perspective.

The Directorate of the Police also refers to the «PBS I», a 241-page publication. The publication is a syllabus subject in the Police Academy, and it founds the basis for a uniform and effective handling for both ordinary and extraordinary events and crises for the police (PBS I). The term «risk» is mentioned 46 times in PBS I but the publication holds no definition of the concept. In the white paper Meld. St. 13 (2015–2016) «Politiets rolle i den nasjonale kriseledelsen», the risk is mentioned one time, but the paper holds no definition of the concept: «A good preparedness culture is open, action-oriented, co-operative, knowledge-seeking and, not least, risk-conscious. The responsibility must not be pushed over to others».

The questionnaire gives two examples of how risk is communicated the Police Directorate´s jurisdictional area of responsibility. In the first example, after a terrorist attack ramming a car into a crowded pedestrian street in Sweden, the Norwegian Directorate of the Police argued that arming the police was a precautionary approach, yet they considered and communicated the danger of being exposed to a terrorist attack in Norway as minimal «we have no reason to believe that we are more exposed (to a terrorist attack) now than before», Chief Director of the Directorate of the Police Knut Smedsrud said in the newscast (NRK newscast).

The second example debates extended security measures for the national day, on a national scale. «Preparations for May 17 and other anniversaries will be determined on the basis of local and central threat assessments, as well as other information the police may have. It is the individual police chief who is responsible for preparedness and measures in his or her police district (…)», Deputy Director Kristin Kvigne explained in an email to NRK. Despite examples of extended security measures, when delegating the responsibility for preparedness and anti-terror measures to the police districts there is no empiric evidence that such delegating are founded in a scientific risk perspective.

However, as explicitly stated in the questionnaire, the Directorate of the Police has not prepared an explicit definition of the term risk. There is no empiric evidence that the Directorate of the Police does not hold proper understandings of fundamental concepts of risk, probabilities, and uncertainties, but the empiricism does imply a mix of various ideas about these concepts within the organization, thus the associated prominent risk perspective is the chaotic perspective.

4.1.3 The Police District of Salten

The Police District of Salten is located in the county of Nordland, in northern Norway's second largest city, Bodø. The chief of police in Salten is located in Bodø Police station together with the administrative unit, the justice, and prosecution unit and the police security service (politiet.no). In the questionnaire, the Police District of Salten defines risk as «probability X consequence» (an objective risk perspective).

A report by the Salten municipality´s revision in 2009 exposed a gap in the municipality´s risk and vulnerability analysis («ROS-analyse»). At the time of the report, the existing analysis was outdated. The report concluded that there was no comprehensive overall representation of what requirements and expectations were to the municipality's security and preparedness within the various preparedness sectors and that this seemed to be missing in the individual sectors of preparedness. As the report is dated 2009 it is not considered a valid empiric evidence for a prominent risk perspective.

In a report made by Norconsult in 2014 to the County Governor of Nordland (the County of Salten Police District), the risk is defined as the combination of probability and consequence of a undesired event. The definition is founded in the NS 5814:2008. The report focuses on a mutual dependency between vital social functions and the chains of events which is relevant to illuminate vulnerabilities in the county.

In 2015, the Norwegian Directorate for Civil Protection published a report «Skoleskyting in Nordland» («School shooting in Nordland»). Nordland is the County of Salten municipality, and the participants to the report included, among others, representatives from the neighboring Police District of Harstad and the Ministry of Justice and Public Security. The report focused on preparedness and it drew uncertainty to probabilities, but the report did not hold a clear definition of the concept of risk. The probability of a school shooting in Norway was considered low, but not unimaginable. This statement favorises a the risk perspective of objective uncertainty, because the as in terror, the circumstances may rapidly change, the report stated without associating uncertainty to the assessment.

An example of how Salten Police District has conducted a risk assessment can be studied from the event of January 2016. Due to a threat to schools in the county, posted on a social media, more than 2000 students were evacuated from the schools in Nordland County. The police advised the school to conduct their school day in the usual way, but with police present. The school management nevertheless chose to send students and employees home for the day (Dagbladet, 13.01.16).

If the assessment was based on a perception of little probability to the threat, this associates with the definition of probability and scenarios/consequences/severity of consequences (R = P,C) (Appendix A, Veland and Aven (2012), Aven, 2012), and thus associated with an objective risk perspective.

4.1.4 The Joint Rescue Coordination Centre Bodø

Norway has two Joint Rescue Coordination Centres (JRCC´s), each with its own area of responsibility. The centers have the overall coordination responsibility for all maritime, air and land management services. Each of the two JRCC´s consists of a rescue team composed of the central cooperative partners and with the regional police chief as the leader. The central governmental cooperation partners in the rescue team shall consist of representatives of the Armed Forces, the Civil Aviation Authority, the Coastal Administration, the Norwegian Maritime Directorate, the National Communications Authority, the Directorate of Health and the Directorate for Social Security and Emergency Planning (Hovedredningssentralen.no).

JRCC do not provide a clear definition or understanding of JRCC´s risk perspective. In the Annual Report for the JRCC´s (2016), the JRCC´s reported «some risk of inadequate manning of operational personnel at major single events or by a large number parallel events». To increase robustness, a redundant factor was identified as increased interaction between the two centers.

Nor the IAMSAR (International Aeronautical And Maritime Search And Rescue Manual 2016 Edition) or the International Convention for the Safety of Life at Sea (SOLAS) defines risk. The SOLAS/ International Safety Management (ISM) Code and Risk Assessment, §3 states that the «requirement to carry out risk assessments should not be interpreted as meaning that companies must employ a single, formal risk assessment methodology.»

In a recent article from 2017, JRCC argued that the societal need and impact consequences of the planned moving of the Armed Forces Bell helicopters from Bardufoss to Rygge were not assessed properly (Nordlys 07.09.17). JRCC argued this could compromise an important search and rescue resource as well as support to the police and the special forces, and that the relocation of Bell Helicopters was not justified in a robust operation analysis nor included a comprehensive need and impact assessment in a broad societal safety perspective. Accordingly to the article, there was great cause for concern for the consequences.

This perspective could support an uncertainty risk perspective, with the uncertainty associated with the possible future consequences. However, it could also represent an objective risk perspective as the article does not argue a scientific risk perspective. Thus the skepticism for moving the Bell helicopters could also be founded eg. in risk perspectives based on anticipations by perceptions or experience of statistical evidence.

Of the many tasks to the JRCC´s, the rescue team shall contribute to developing the collaborative rescue service. They shall meet regularly to review the activities of the JRCC and to plan and submit proposals to the Ministry of Justice and Emergency Planning on any measures for rescue services. In disagreement with the rescue team, the police chief determines (Hovedredningssentralen). The rescue team, subordinated the police chief, reports to the Ministry of Justice and Public Security (Lovdata). According to the questionnaire and the data analysis, JRCC Bodø does not hold a clear definition of the concept of risk but refers to its organization and its guidelines (Questionnaire;The Joint Rescue Coordination Centre Bodø, Appendix D). The findings and the organizational matters of the rescue team imply that risk assessments and decisions are not founded in a specific scientific approach, or that risk is assessed with a mix of various ideas about the concept (Veland and Aven, 2012). By this, the overall prominent risk perspective associated with a chaotic risk perspective.

4.1.5 The Governor of Svalbard

The Governor of Svalbard is both Chief of Police and has the same authority as a County Governor on the mainland. The office consists of an Environmental Department, a Police Department, an Administrative Department and a Staff Section. An example of collaboration with governmental organizations on the mainland is maritime traffic communication (Sysselmannen). The Governor of Svalbard has prepared a risk and vulnerability analysis for Svalbard. The document highlights a range of risk areas within the main categories of natural events, major accidents and serious intentional actions. The complete analysis is except publicity. A public version is available as a related document (Sysselmannen). The risk and vulnerability analysis mentions «risk» 65 times in the document, but with no clear definition of the concept.

The analysis has assessed various threats in the analysis. In the assessment of a nuclear accident, the probability of such an event is considered low but the consequence is considered high. With reference to the Norwegian Police Security Service (PST), the probability of a non-state actor will carry out a terrorist attack with nuclear or radiological means in Norway is considered low. In an event of a nuclear or radiologic threat to Svalbard, the risk and vulnerability analysis states that «effective preparedness and handling after nuclear events are dependent on good and practiced procedures for rapid alerting and information to the population» («Svalbard Risiko- og sårbarhetsanalyse 2013»). In August 2017, the Norwegian Government issued an investigation for a separate scenario with the use of nuclear weapons on, or near, Norwegian soil (NRK,02.09.17). In the article, the Norwegian Radiation Protection Authority (NRPA) indicates that «the changing situation in the world and a threat that is still changing. The threat picture has changed so it is relevant to think that a nuclear explosion may occur in or near Norwegian areas».

An identified preparedness measure in the governor's risk and vulnerability analysis, is storage of iodine tablets in Longyear City, in which at present, there are none. On a large stock at Norsk Medisinaldepot in Oslo, an important part of Norwegian nuclear preparedness is stacked on high shelves. According to the Norwegian Directorate of Health, approximately 300,000 packs or three million iodine tablets are stored here (NRK, 02.09.17). If iodine tablets are not stored locally, they do not represent a civil preparedness measure, as Iodine tablets only protect if they are taken before, or within a few hours after radioactive iodine enters the body (Jaworska, Jærstad, Holo 2012). Intake of iodine tablets is an appropriate measure when the inhalation of radioactive iodine is expected to provide a significant part of the dose contribution. The measure (of iodine tablets) will often be relevant to shelter indoors or evacuation (Strålevern Rapport 2012:8).

The risk and vulnerability analysis has identified an event causing a radiologic threat as a risk (R). There is a knowledge of the probability of this threat; among many probabilities for a radiologic threat to its inhabitants, Svalbard has several nuclear-powered ships visiting its ports during a year. If the reason for not storing iodine is because the probability of a radiologic threat is considered low (P) and the use of (objective) numbers are used to credit future probabilities, the risk perspective is objective (Aven, 2007). Opposite, preparedness measures for distribution of iodine tablets and plans for an evacuation of inhabitants in case of a radiologic emergency could illustrate an example of an associated pro-active or uncertainty risk perspective, Absence of measures of distribution of iodine tablets to inhabitants could be associated as a retrospective preparedness measure and thus associated with an objective risk perspective if this is founded in a risk assessment.

In the search for other risk-related data relevant for the Governor of Svalbard, the 86 page «Strategic port plan for Longyearbyen» shows yet another example where risk is mentioned but the concept is not defined (the concept is mentioned 9 times). The report is not prepared by the Governor of Svalbard, yet it holds consensus for the risk perspective in the questionnaire (the Governor of Svalbard has not defined risk as a concept) as the local government has adopted the plan. Document studies support the subjective impression from the questionnaire that the term risk in the organization (the Governor of Svalbard) and its partners are becoming utilized from risk = probability X consequence. However, as explicitly stated in the questionnaire (The Governor of Svalbard, Appendix C), the Governor of Svalbard has not defined risk as a concept and there is a consensus with this statement and the findings from vulnerability analysis for Svalbard («Svalbard Risiko- og sårbarhetsanalyse 2013») where risk is mentioned 65 times but not defined as a concept.

Thus, the findings and the organizational matters of the Governor of Svalbard implies that risk assessments and decisions are not founded in a specific scientific approach, or that risk is assessed with a mix of various ideas about the concept (Veland and Aven, 2012). By this, the overall prominent risk perspective associated with a chaotic risk perspective.

The Norwegian Coastal Administration with subordinate divisions

The Norwegian Coastal Administration (NCA) is an agency of the Norwegian Ministry of Transport and Communications responsible for services related to maritime safety, maritime infrastructure, transport planning and efficiency, and emergency response to acute pollution. NCA has nine operative units: five regions, the shipping company, the Pilot Service, the Centre for Emergency Response and the head office (Kystverket.no).

The NCA is responsible for the national pilot services. The pilot service helps to safeguard sea traffic and protect the environment by providing the crew's crew with the necessary Maritime Situational Awareness. The service is operational 24 hours a day throughout the year. A related task is to safeguard sea traffic and protect the environment by ensuring that vessels traveling in Norwegian waters have navigators on board with sufficient competence to make safe sailing.

On a national basis, the NCA has just under 290 pilots in service, stationed at 18 pilot stations. The pilots embark the vessels at designated embankments along the coast by means of a boat or helicopter. Once aboard the vessel, the pilot operates as an adviser that supplies the crew with the necessary knowledge of the waters during sailing to and from Norwegian ports.

In times of tension or conflict, NCA will cooperate closely with civilian authorities as eg. the Police, Customs, Pilots, Port authorities, Port Control Authorities, Directorate of Fisheries and other civilian authorities and adequate assets in order to contribute to a fused Maritime Situational Awareness (MSA) picture (Amendment to the NOMTAC[3]).

4.1.6 The Norwegian Coastal Administration

The Norwegian Coastal Administration distinguishes between different types of risk management;

1. Overall risk management: Risks are circumstances or events that may adversely affect the achievement of goals (R = C)
2. Operational risk management: NS-ISO 31000: The effect of uncertainty on objectives (ISO 2009a, b) (R = ISO)

The overall risk management is a management tool for identifying, evaluating and managing risks related to achievement and resource utilization. Operational risk management is a management tool for identifying, assessing and managing risks related to the Coastal Center's core and central support processes and is often seen in the context of unwanted events.

An FFI report (16/02319) to NCA recommended the NCA to establish a risk-based supervision on the ports' security profile as well as the ports' own conducted vulnerability assessments. The report also presents a model for risk-based supervision in which the model and the recommendations are based on «theoretical contributions from relevant scientific literature and on practical experiences».

Both overall and operational risk management are management tools that will prevent the risk of different activities being identified, evaluated and handled in advance. Overall risk management in

[3] The amendment to the NOMTAC presented at the NCAGS seminar, attachment 3)

the Coastal Administration is conducted in line with the latest version of the methodology called «Risk Management in the State», prepared by the Center for State Financial Management based on the regulations for financial management in the state (Appendix A; Questionnaires, The Norwegian Coastal Administration).

According to the NCA, operational risk management is conducted in accordance with the principles of the NS standard and the overall risk management procedure, while operational risk management in relation to the Norwegian Coastal Service's service production is based on «NS-ISO 31000» (Appendix A; Questionnaires, The Norwegian Coastal Administration).

The Overall risk management is exercised by managers in the Coastal Administration with goal and performance responsibility. Operational risk management is exercised by managers and employees at the Coastal Administration with professional responsibility (Appendix A; Questionnaires, The Norwegian Coastal Administration).

The NS 5832: 2014 «Social Security - Protection against Intended Activities» was prepared in cooperation between the Coastal Administration and the Recognized Security Organization (RSO) (Kystverket, 24.04.14). The background for the document was the need for a common template for what a Port Security Plan (PSP) shall contain. The template is based on «regulations about Security of ports and port terminals against terrorist acts», (3. July 2007, Annex 3) (see also EU Directive 2005/65). The document presents a matrice of the hedging measures implemented at ISPS levels 1, 2 and 3. The purpose is to enable an effective communication between NCA, the police and other agencies (the municipal, the local Police, customs, the Armed Forces and NCA) about the port´s preparedness measures, but the regulations do not define risk.

The document emphasizes that key and important requirements of the directive are a vulnerability assessment for the port. Based on the assessment, a plan for cooperation with other agencies shall be developed and utilized. This requires establishing a formal communication with respective authorities (including the police) who are in charge of other contingency plans on a national and municipality level, to ensure that coordination between responsible actors is actually carried out. The plan must provide a basis for assessing/determining to what extent safeguards must be implemented. (In case of specific events this will often be decided in cooperation with the local police and the Coastal Administration).

In 2014, a Safety Analysis (2014) to the NCA from the DNV GL Maritime Advisory (Assessment of prevention maritime safety measures NCA 2014), explained risk;

«Risk is an expression of potential events that may occur and potential negative consequences of these events. No activity can take place without risk, that is, without any uncertainty about what The consequences of the activity can be. One way to define risk is to see it as a relationship between the likelihood that a undesired event will occur, and any consequences or losses as consequence of this event. Risks can then be expressed as the product of the two, that is, the probability multiplied by the consequence».

According to the questionnaire, the NCA´s overall risk management for port security is based on the NS 5830:2014 standard which defines risk as «the relationship between the threat against a given value and the vulnerability of this value to the specific threat»;

Thus, R = threat to a value
The values´ vulnerability to the given threat

Aven criticizes the risk perspective in the NS 5830, questioning the formula of the definition. Aven claiming, that the relationship between the factors does not reflect risk, as security is either absence or presence of unwanted events and thus a degree of security, does not make any sense. Despite differences in safety and security, a risk is always concerned in a relationship with something (Aven, FFI report 2015/00923, p.94 - 95).

In the questionnaire, the NCA defines risk = probability x consequences (Appendix A; Questionnaires, The Norwegian Coastal Administration). The use of various definitions and understandings of risk in the questionnaire implies a that the NCA assessments holds an overall mix of various ideas about the concept of risk and thus the overall prominent risk perspective associated with the chaotic risk perspective.

4.1.7 The Norwegian Oceanic Region Vessel Traffic Service NOR VTS

The NOR VTS geographical area of responsibility is the sea area between Greenland and the border with Russia and extends from 65 degrees north to the Norwegian coast and up to the North Pole. The NOR VTS monitors all tanker and other risk traffic along the entire coast and the sea area around Svalbard, with the exception of the work areas of the Coastal Administration's four other maritime traffic centers (Kystverket 17.08.11)

In 2014, a Safety Analysis (2014) to the NCA from the DNV GL Maritime Advisory (Assessment of prevention maritime safety measures NCA 2014), explained risk;
«Risk is an expression of potential events that may occur and potential negative consequences of these events. No activity can take place without risk, that is, without any uncertainty about what The consequences of the activity can be. One way to define risk is to see it as a relationship between the likelihood that a undesired event will occur, and any consequences or losses as consequence of this event. Risks can then be expressed as the product of the two, that is, the probability multiplied by the consequence».

According to its official website, the traffic center's task is to collect, process and evaluate data on shipping traffic (Kystverket 17.08.11). In close cooperation with several governments, among these are the armed forces and the Joint Rescue Coordination Centre (JRCC), the combination of advanced technology enables early detection of maritime deviance patterns which enables preparedness measures to avoid unwanted incidents. NOR VTS has defined the risk of size and type of cargo, either together, or separately and referred to risk in their regulations, procedures, instructions, and checklists. The NOR VTS is included in many exercises and events that provide increased knowledge of handling events at sea and increased competence within the traffic center's data and communication systems (The Norwegian Oceanic Region Vessel Traffic Service NOR VTS, Appendix D, Questionnaire).

The example of a permission to a ship based on a checklist can be considered as an objective risk perspective. A permission is granted when criteria are fulfilled (checklist). Normally, a checklist represents a tool to reduce errors or failure by replacing perception or memory with procedures, and are used in various environments to ensure critical steps or actions are taken to prevent an unwanted

state or event. If a checklist is developed by a best-management practice example, it is often made on experience and thus a tool to avoid common (known) errors.

The given criteria in the example represent stochastic variables; a ship, it´s construction and it´s cargo, along with factors of weather, wind, visibility etc. These factors are identified as threats to an unwanted incident (grounding, collision, oil spill etc.) and are based on knowledge of what might happen in a situation (what kind of ship, what kind of cargo, what kind of visibility, weather etc.).In the perspective of an underlying objective risk, based on frequentist probabilities, the perception of stochastic uncertainties methods are considered sufficient to communicate epistemic uncertainties. The risk perspective rejects subjective probabilities unless the information is very strong (Veland and Aven, 2012). However, as in the example of the precautionary principle, this could imply the use of the uncertainty perspective.

Associating a prominent risk perspective to NOR VTS Vardø, the questionnaire, the information from its parent organization (the Norwegian Coastal Administration uses the ordinary definition Risk = probability x consequences in their environmental risk and oil spill response analysis), given the brief explanation in the questionnaire, the prominent risk perspective is associated with a non-probabilistic frequency based risk perspective (Risk = Probability x Consequence).

4.1.8 The port of Mo i Rana

The port of Mo i Rana is strategically located at the intersection of the highways E6 and E12 to Sweden and Finland, as well as the Norwegian State Railways (NSB) main network in Norway (moiranahavn.no). The port of Mo i Rana is proposed as the intermodal transport hub port of departure in the national transport plan for 2010-2019. In 2015, the port reported 1172 ship calls, handling 1 531 270 tonnes of domestic and 3 312 542 tonnes of foreign goods (Godsstatistikk Mo i Rana Havn).

The Port of Mo i Rana defines risk as «the danger of something undesirable with subsequent negative consequences» (Appendix D, Questionnaires, The port of Mo i Rana). No relevant data was found to analyze the observation further. The danger of something undesirable, with subsequent negative consequences, implies an expected value (loss) (R = E). Thus, this is an association with the objective risk perspective (Appendix A, Veland, and Aven (2012), Aven, 2012).

The Royal Norwegian Ministry of Defense with subordinate agencies

The Ministry of Defence is a Government Office with responsibility for the formation and implementation of Norwegian security and defense policy. The Ministry is responsible for the overall management and control of the activities of subordinate agencies. The Minister of Defence is, as head of the Ministry of Defence, constitutionally and parliamentarily responsible for all decisions made, and actions taken, in the Ministry and its subordinate agencies (regeringen.no).

4.1.9 The Ministry of Defense

Responsible for the design and implementation of Norwegian security and defense policy, the Ministry of Defence covers the overall management and control of the activities of the nine underlying agencies (regeringen.no).

Over the last years, the Ministry of Defence has been subject to criticism in media due to their risk assessments. In 2013, the Ministry of Defense believed a mission to extract weapons of mass destruction (chemical weapons) from Syria were not dangerous enough to rise the salary for participating soldiers according to regulations of mission compensations. Prior to the mission, the officer union («Befalets Fellesorganisasjon») demanded, based on the situation in the area, the uncertainty of the mission and the uncertainty about which constitution the chemicals were to be taken on board actually were in, that the risk surcharge should be set at a high rate. Despite the arguments from the officers union, based on the expert assessment from the Norwegian Joint Head Quarters and the Norwegian Defence Research Establishment, the Ministry of Defense stated that the risk was low and cut the soldiers' salary (VG, 10.12.15).

In 2017, the Auditor General, claimed that the collaboration between the Ministry of Justice and Public Security and the Ministry of Defence to protect key national institutions using security forces and physical measures, was inadequate and that the poor security of information systems posed the risk that important social functions could be put out of business (Aftenposten). According to the Auditor General, both the lack of cooperation and the poor security of information systems posed risk to important social functions. However, Chief of Defence, Admiral Haakon Bruun-Hanssen, id not agree at all with the Auditor General´s conclusion; «I do not share the OAG's assessment that the Armed Forces are unable to provide proper object protection. We have the knowledge, expertise, and material to protect any object», Bruun-Hanssen determined on the first day of the two-day hearing (Aftenposten, 20.03.17).

Concerning risk as potential deviations from the expected or potential deviation from their goals, the Ministry of Defence defines risk as «a combination of possible consequences (outcome or result) and associated uncertainty.» (Appendix D, Questionnaires, The Ministry of Defence). This definition of risk associated with the uncertainty perspective (risk is the deviations from a reference level (ideal states, planned values, expected values, objectives, and associated uncertainties (R = (C,U)), (Aven, 2012) (Appendix A)).

4.1.10 The Norwegian Defense University College

The Norwegian Defence University College (NDUC) offers the highest professional military education in Norway. NDUC consists of five departments with five subdivisions. Among these, the Norwegian Defence College (NONDC) gives key personnel in the Norwegian society and the Defence knowledge of and insight into defense-, foreign- and security political factors that affect the Norwegian society. The Norwegian Defence Command and Staff College (NORDCSC) qualifies personnel for staff service and executive positions on an intermediate and higher level in the war and peace organization. NORDCSC contributes to professional qualification of staff within teaching strategy, operations and staff service. The Norwegian Institute for Defence Studies (IFS) conducts research within the areas of military theory and strategic studies, Norwegian security policies, defense politics, defense analysis and international conflict and co-operation reviews (forsvaret.no:hogskolene).

An example of how the NDUC offers expertise to the armed forces, is the the Armed Forces Joint Operational Doctrine (FFOD) which has been prepared at the Defense Staff School (FSTS), the subdepartment of The Norwegian Defence University College (NDUC).

In the questionnaire, some examples of how the risk term is expressed in different documents, situations and contexts, which are also used in different contexts at NDUC are presented:

In operational contexts, the Armed Forces use largely NATO definitions as the basis for their use and understanding of the «Risk» concept, and then to describe risks associated with planning, implementation, and evaluation of military operations. For example, the main concept «Operational Risk», expressed in two dimensions (NATO, Allied Command Operations Comprehensive Operations Planning Directive, COPD Interim V2.0, Mons: Supreme Headquarters Allied Power Europe, Belgium, 2013a), 4-49) is used:

1) Risk to Mission = Risk associated with achieving operational goals (ie, uncertainty about whether or not goals can be achieved).

2) 2)The risk to Force = Risk of own forces as a result of conditions in the operating environment (where there is the military activity) and other players' capabilities and actions in the operation area.

This rests on an underlying understanding that military operations can pose a risk of loss of own strengths, materials, and values. This is because the military forces are merely a means of achieving politically determined goals and power while at the same time being subject to both ethical and legal laws and policies applicable to the use of military power. The risk concept is also linked to different aspects of the use of military force and methods of warfare. A Central term is the Center of Gravity (CoG).

This term is found in various Norwegian doctrines (for the different weapons and common - Armed Forces Joint Operations Doctrine, 2014 (more fully covered in earlier versions), and is thus incorporated into operational guidance documents for the Armed Forces (see also the Staff Manual, attached p. 30 for the division of the document hierarchy / authority, the staff manual applies the risk concept also in several contexts, see attached document.)

The CoG concept covers the relationship between own vulnerability and strength, ie the risk of changing the center of gravity during an operation. Such a risk assessment implies the probability assessment of defeat/victory (achievement of politically assigned missions/goals) in the short or long term. Such ratings are also referred to as risk identification (ibid.). However, the term «risk» alone is not defined in these documents.

Overview of some key official documents where the «Risk» concept is used with given specific definition/explanation (documents can be obtained on request):

The risk in the meaning of «Safety Management» in the Air Force Security Management (BF-L 010-1 (2017)), where a number of related expressions are also defined and exemplified (document attached).

The following is used in the Armed Forces' Educational Principle (2006) (developed by FHS / FSTS), which is a training document in education, applicable to the entire Armed Forces: «... During training and exercises, risk and safety must be thoroughly and thoroughly assessed in all didactic phases.» (P. 23). «Risk» is only mentioned once in Meld. St. 14 (New Age Skills). This document sets out the basis for competence management in the Defense sector (applicable to all agencies). The «Risk» concept is not included as part of the document's main text, but appears in a fact box about the response defence, and is expressed in the light of the risk of others in terms of attacks: «Modern capabilities and high responsiveness will give the one who challenges Norwegian security and independence high risk and costs.» (p. 14).

The risk term is used consistently in DIVØ, but does not contain definitions, and uses the risk concept in the light of traditional (civil) business management, also referred to as the main features of the Staff Manual.Concerning risk as «an event that is being developed under unpredictable conditions. As a consequence, the outcome may be undesirable or negative, with potentially dangerous loss of life, values or otherwise defined as valuable, essential and important, generally or in a given context. However, an uncertain outcome can also incorporate positive and desired consequences, for example in relation to learning processes in a training context, and which are not planned in advance.»

This definition of risk associated with the theory of Risk = Expected Value (R = E) (Appendix A). However, this example is related to white papers or research reports at NDUC which uses own definitions or founds the concept in external sources, also temporarily used in a project of «Unexpected Events and Cooperation in light of Risk» (The Norwegian Defence University College, Appendix D, Questionnaire).

NDUC states it has not identified an overall specifically developed definition / use of the risk term, only applicable to the Defense College / Defense Staff School: «In our core business, teaching, research, and doctrine development, the risk term is used primarily as expressed in official defence / sector management documents, from civil and general sources (eg textbooks or ISO), or context-specific descriptions / definitions of the term in connection with teaching / projects / research / doctrines (as the individual develops and adjusts for his/her use)».

The use of various definitions and understandings of risk in the questionnaire implies that the the NDUC presents a mix of various ideas about the concept of risk in which might represents an association to the chaotic risk perspective.

4.1.11 The Norwegian Join Head Quarters

The Norwegian Joint Headquarters (NJHQ) operates day and night and has the overall command and control of all military activity in Norway. It also commands the Norwegian military personnel abroad. In Norway, it controls activities like the Coast Guard, the search and rescue service, military air traffic, and the Border Guard (Forsvaret: Norwegian Joint Headquarters).

The NJHQ has developed several tools for risk assessment and is used in the planning process and throughout the planning process (Questionnaire NJHQ, Appendix D). An example of their risk assessment tool, presented in the questionnaire, is the risk matrices where risk = probability x consequence. This is associated with the objective risk perspective. With consequences, the various hazards shall be determined. With probability, the occurrence of the various hazards shall be determined (NJHQ, Appendix D, Questionnaire).

The NJHQ separates the approach to risk;

The NJHQ separates the approach to risk;

- Security Risk - the likelihood (P) of operations inherent vulnerability being exploited by the threats, leading to the operations being compromised or missing the wanted impact on the enemy or the wanted result (C). Thus, R = P x C

- Security Risk Management - the process of identifying, controlling and minimizing events that may give an undesirable effect on operations.

The security risk perspective is consistent with the NS5830 (Aven, FFI report 2015/00923), where risk is defined as «an expression of the relationship between the threat and a given value, and this value´s vulnerability to the given threat» (FFI report 2015/00923).

$$\text{Thus, } R = \frac{\text{threat to a value}}{\text{The values´ vulnerability to the given threat}}$$

According to the questionnaire, the NJHQ risk assessment will, in reality, be the various reports, assessments, Commanders Update, Joint Co-ordination Board and other meetings and briefings in the HQ as required. Reports and other products will be put into the Operational Orders and Plans as required and deemed necessary. This method associated with the chaotic risk perspective. Unless every report, assessment, commanders update, joint-coordination board, meetings and briefings use a common risk perspective, the overall assessment could be based on a mix of various ideas and concepts of risk.

A public example of risk assessments by the NJHQ is found in an event in May 2017. As a part of a naval exercise, the US Cruiser «USS Leyte Gulf» was docked in the port of Tromsø. Due to cut back in fundings to the Naval National Guard, the Norwegian contribution to safeguarding the security of the US military vessel was a hired unarmed, 20-foot leisure boat. After facing criticism for the safeguarding of USS Leyte Gulf, the Armed Forces increased its presence when the ship returned to another port visit. According to the Norwegian Joint Head Quartes, the force protection they provide to allied vessels is based on the same threat assessments, in this case considered as

sufficient as the last port visit by USS Leyte Gulf, and is carried out by the same department as the last time the ship arrived at Tromsø (Aldrimer, 04.09.17).

An example of risk communication from the NJHQ is found in a chronicle written by General Major Rune Jakobsen, Chief Defense NJHQ and Cecilie Daae, Director of DSB (Kronikk: – Vi må ikke være naive, 2017), the role and tasks of the NJHQ to civil preparedness are explained. As the Armed Forces support important social issues, the NJHQ have a close cooperation with civil society bodies daily. Through the last year's efforts to update national defense plans, the Armed Forces have seen that in many areas support from civil society is needed in areas such as communication, health, transport, and logistics (Jakobsen and Daae, 2017).

The challenges with new politics require preparation for the whole spectrum of crises and, at worst, a new war. Particularly important is the ability to facilitate allied support, as it is an important prerequisite for a credible defense of Norway. Based on NATOS's solidarity principle, Allied soldiers, aircraft, and ships will support Norway in a situation where our sovereignty is threatened. However, it is demanding to receive such extensive forces and provide the assistance and support they need to operate in Norwegian territory. The task surpasses the Armed Forces capacities (Jakobsen and Daae, 2017).

The responsibility for protecting citizens against threats to functions and infrastructures to which the society is dependent on, regardless of the type of crisis or natural disasters, war or events where we are exposed to stresses in the gray zone between war and peace, such as situations where a foreign force or other opponent wishes to influence us by using hybrid instruments instead of weapons, are central to both DSB and the Armed Forces.

The Chronicle outlines that the concept of total defense has a comprehensive approach to what measures the society can do to strengthen its resilience, and that «notification of danger and communication with the population during crises are other elements that must work». The chronicle does not take a stand to a risk perspective, however, it messages concerns to uncertainties about possible future events, and that assessments to build a resilient society is a responsibility for the NJHQ, the DSB and the society in general (Jakobsen and Daae, 2017).

Associating NJHQ to a prominent risk perspective, there are identified several risk perspectives. According to the questionnaire, the outcome of an NJHQ Risk Management process will be the coordinated inputs from the Joint Staff with respect to the different Domains. The NJHQ risk assessment will, in reality, be the various reports, assessments, Commanders Update, Joint Co-ordination Board and other meetings and briefings in the HQ as required. Reports and other products will be put into the Operational Orders and Plans as required and deemed necessary (Questionnaire NJHQ, Appendix D).

Aven criticizes the risk perspective in the NS 5830, questioning the formula of the definition. Aven claiming, that the relationship between the factors does not reflect risk, as security is either absence or presence of unwanted events and thus a degree of security, does not make any sense. Despite differences in safety and security, a risk is always concerned in a relationship with something (Aven, FFI report 2015/00923, p.94 - 95). The use of various definitions and understandings of risk in the questionnaire implies a that the NJHQ risk assessments hold a mix of various ideas about the concept of risk (Veland and Aven, 2012). By this, the overall prominent risk perspective associated with a chaotic risk perspective.

4.1.12 The Norwegian National Guard District 14

The Chief of the Norwegian National Guard District 14 (HV-14) has the local territorial responsibility, which includes military defense preparedness, assistance to civil society and the management of military operations on behalf of the Armed Forces Operational Headquarters (NJHQ). Chief HV-14 exercises its command through 18 area managers and a deputy chief executive. The HV-14 has extensive cooperation with the police, counties and all municipalities in the area of responsibility. Civil defense, rescue services and other key actors in society are also part of the district's cooperative network (Forsvaret: Sør-Hålogaland heimevernsdistrikt 14).

The Norwegian Natonal Guard District 14 did not want to not answer the questionnaire. The rejection was justified in the uncertainty any consequences of exposing their definition of risk to a third party would imply. The polite rejection was given by telephone and no transcript of the rejection is available.

4.1.13 The Norwegian Coast Guard

The Coast Guards tasks are fishing surveillance, environmental protection, search and rescue and customs supervision. The Coast Guard law (Kystvaktloven) mandates control on behalf of several state agencies, with close collaboration with the Police, Customs, the Coastal Administration and the Maritime Directorate (Forsvaret: Kystvakten). The Coast Guard is organized under the Norwegian Join Head Quarters (NJHQ), and in times of tension, crisis or conflict the Coast Guard shall also analyze and designate all relevant tasks within the maritime domain that must be resolved by the Navy (Engeness, 2015). Though referring to fishery activities as risk areas in the questionnaire, the Coast Guard has also been exposed to risk in several events. In 2005, the Russian trawler «Elektron» was hailed and arrested by the Coast Guard on suspicion of serious violations of the fisheries regulations. Refusing orders, the «Elektron» changed course and fleed to Russia, still carrying two Norwegian inspectors on board. The two inspectors were caught onboard but later they were set free when the episode rose to a diplomatic level between Norway and Russia (NRK, Brennpunkt; Oppdrag Elektron.

Debating future tasks and responsibilities, the Chief Coast Guard, Sverre Engeness, arguing the role for the Coast Guards as Norway's most important security policy player. Though a geopolitical tension or crisis in the High North might seem little probable, instruments of «new» conflicts used in some of the world's conflict areas, are hybrid warfare and terrorist attacks from paramilitary. Such threats poses examples of criminal acts and a threat to legal challenges other than those covered by the international law of the war, and the Coast Guard represents thus an amplified resource other to the Navy, where the Coast Guard, with its law enforcement agency, can intervene and prevent, and as far as possible dealing with offenses by prosecution. The questionnaire does not provide a clear definition of risk. In the Coast Guard Operational Risk Assessment (2017), probability implies that (a unit) should take into account, the possibility that what is being addressed in the risk area will occur. Assessment of consequence is based on intelligence, experience, assessment of the year's regulations, control history, market situation and local knowledge (Kystvaktens Operasjonelle Risikovurdering 2017). The Coast Guard Operational Risk Assessment describes risk as the relationship between probability and consequence (probability x consequence, or R = P &C), Thus, this is the association with the objective risk perspective (Appendix A, Veland, and Aven (2012), Aven, 2012).

Central Shipping Community Actors in Naval Cooperation

NATO has stated that the maritime trade is of fundamental strategic importance to nations; indeed, societies' welfare and economic wealth depends on the ability to trade, which in turn depends on freedom of navigation. There are several forums around the world to exchange information of importance to merchant shipping matters. The Maritime Security Centre on the Horn of Africa (MSCHOA), the United Kingdom Maritime Trade Operations (UKMTO) in Dubai or the The IMB Piracy Reporting Centre (IMB PRC) are examples of fusion centers for maritime risk communication (Shipping.nato.int).

4.1.14 The NATO Shipping Centre

The NATO Shipping Centre´s (NSC) mission is to provide an improved information exchange on merchant shipping matters and facilitate increased voluntary co-operation between military commanders and commercial shipping operators (Shipping.nato.int). The two primary tools of the NSC are the concepts of Naval Cooperation and Guidance for Shipping (NCAGS) and Allied World Wide Navigation Information System (AWNIS) (Shipping.nato.int). In Norway, the NCAGS organization is organized in the planning division of the naval staff (ncags.com). For NATO and the merchant shipping community, the NATO Standards related document ATP-02.1[4] serves as a manual for procedures in naval cooperation. It states that in time of peace and tension the NSC is conducting NCAGS on behalf of NATO. Throughout the whole concept of NCAGS, also for civilian ships and civilian governmental organizations, the ATP-02.1 serves as manual for procedures in risk communication. In the ATP-02.1, the term risk is mentioned 23 times but holds no definition of the concept.

The questionnaire does not provide a clear organizational definition of risk, but a subjective perception. In the NATO Shipping Centre Strategic Vision (Shipping.nato.int), the NSC aims to be an advisor on security risks to commercial shipping, and source of advice to Military Commanders on maritime security risks to the wider maritime community. The Strategic Vision states that the key to achieving an improved maritime security network is based on «maintaining, developing and improving organizational relationships to build trust, collect and share information, to achieve an increased overall shared understanding of maritime issues/risks to improve security for all mariners». The strategic vision has mentioned risk 10 times but the concept is not defined or contextualized. The use of various definitions and understandings of risk in the questionnaire implies a that the NSC has no scientific foundation upon the results from a risk assessment, or that the risk assessment, and/or decisions from the risk assessment, are not founded in a scientific approach, or, like in this example, that the assessment holds a mix of various ideas about the concept of risk. The associated prominent perspective of risk is the chaotic perspective.

However, the questionnaire also states that «As for a military organization my perception and difing of risk is clearly two-fold (…)». The perspective of risk = perception, is a judgment (belief, appraisal) held by an individual, group, or society about risk and may have been influenced by a variety of sources, but it´s not founded in a scientific perspective (Veland, Aven, 2012).

[4] ATP-02.1 NAVAL COOPERATION AND GUIDANCE FOR SHIPPING (NCAGS) – GUIDE TO OWNERS, OPERATORS, MASTERS AND OFFICERS

As the NSC holds no clear definition of the concept and the concept is not contextualized, given the information in the questionnaire, the analysis associates the prominent risk perspective as risk = perception (Appendix A, Veland, and Aven (2012)).

4.1.15 Naval Cooperation And Guidance for Shipping Norway

NATO has established NCAGS to support military operations which may influence on civilian shipping. According to its national webpage, NCAGS (Norway) will provide support to military commanders and enhanced safety and security to civilian shipping in peacetime, tension, crisis and conflict (ncags.com). NCAGS Norway states in the questionnaire that the term risk is not specifically defined in NATO doctrines. NCAGS Norway referred to a draft of tactics, techniques, and procedures (TTP´s) (Attachment 2), where «risk «and «threat» are being frequently used as synonyms and «closely linked to vulnerability».

The drafted TTP´s implies risk as a function of probability and consequence, but it also holds a mix of risk perspectives. In the comments to TTP Vulnerability Assessment, a vulnerability assessment is an example of an NCAGS analytical activity:

(a) As part of the planning process, risk criteria are developed by the staff. NCAGS will undertake vulnerability assessments of individual merchant ships against these criteria.

Through the study of the ATP-02.1 (NCAGS Guide to Owners, Operators, Masters, and Officers) (Risk is mentioned 23 times but holds no definition), and the questionnaire data, the prominent risk perspective associated with the chaotic risk perspective. The chaotic perspective implies that the transmitter of the assessed risk holds a mix of various ideas about the concept of risk (Veland and Aven, 2012).

4.1.16 The Norwegian Shipowners' Association Contingency Planning Department

The Norwegian merchant fleet is the fourth largest in the world (Maritime forum, 13.01.14). The Norwegian Shipowners' Association (NSA) is an interest and employers organization for Norwegian-related companies in shipping and offshore construction. In 2016 their 138 members with a 30 650 825 bt. capacity on 1327 ships, employed more than 55,000 seamen and offshore workers from more than 50 different nations (rederiforbundet.no). The NSA runs an emergency and preparedness department for the Norwegian controlled fleet (Rederiforbundet.no). Acknowledged for its importance to civil preparedness, as an organization with roles and tasks to naval cooperation (the amendment to the National Crises Response Manuals), the NSA plays an important role as a satellite for communication from third parties to its members, for implementation of naval cooperation in crisis and conflicts.

In 2015, the Norwegian Defence Research Establishment Norwegian (FFI) assessed different approaches to risk assessments in the Norwegian Defence Estates Agency (NDEA) (FFI-rapport 2015/000923). NDEA´s approach to risk assessments was founded upon the Norwegian Standards for protection against intended unwanted actions; NS 5814: 2008 where risk is defined as an «expression of the combination of the likelihood of and the consequence of an unwanted event», and NS 5832: 2014 where security risk is defined as an «expression of the relationship between the threat to a given value and that value vulnerability to the specified threat», often called the three-

factor model. The FFI report identified that assessments based on NS 5814: 2008, distinguishes itself from the NS 5832: 2014 with the approach, based on a probable knowledge, that a hostile attack will succeed. Utterly, differences between the two standards are reflected in how risk is communicated. The three-factors intended to communicate the results of the NS 5832: 2014 illustrates just what factors are used, not reflecting the associated uncertainty to the assessment.

As stated in the questionnaire (Appendix A; Questionnaires, The Norwegian Shipowners' Association Contingency Planning Department), the NSA uses the NS 5832: 2014 three-factor model, defining risk as «the relationship between the threat against a value, and the vulnerability of the value from the specified threat», thus;

$$R = \frac{\text{threat to a value}}{\text{The values´ vulnerability to the given threat}}$$

The definition of risk in the NS 5832: 2014 is defined as «pure risk». Aven criticizes the risk perspective in the NS 5830, questioning the formula of the definition. Aven claiming, that the relationship between the factors does not reflect risk, as security is either absence or presence of unwanted events and thus a degree of security, does not make any sense. Despite differences in safety and security, a risk is always concerned in a relationship with something (Aven, FFI report 2015/00923, p.94 - 95). Thus, the prominent risk perspective within the NCA Contingency Planning Department associates with the chaotic risk perspective. The chaotic perspective implies that the transmitter of the assessed risk holds a mix of various ideas about the concept of risk (Veland and Aven, 2012).

4.2 Document studies II

The representative organizations with roles and tasks for naval cooperation and civil preparedness make risk assessments based on their jurisdictional area of responsibility. The span of rules, regulations, and guidelines is wide and complex. Knowledge of how organizations adhere to how rules and regulations define risk and/or recommends risk assessments, might be an important key to success in risk communication.

The following subchapters present studies from relevant documents in which the questionnaires has referred to. Also, white papers, rules, regulations or guidelines which might affect the different actors perception of their conceptual beliefs/definitions of risk/risk perspectives are studied

4.2.1 National Risk Assessment´s

The Norwegian Directorate for Civil Protection (DSB) prepares the National Risk Assessments[5]. Separate risk analyzes are made of very different scenarios. Since 2011, DSB has conducted risk analyses of a number of serious scenarios that may affect Norwegian society. The analyzes are presented in reports called «National Risk Image». As of 2017, the report changed the name to «Crisis Scenarios» (DSB,). In addition to presenting the results of each analysis individually, they are also summarized in charts. Therefore DSB emphasizes a comprehensive approach to the risk analyzes with common methods to ensure consistency in which the different scenarios are analyzed (DSB, 2015).

The DSB presentes the «Approach to the National Risk Assessments»[6] in the 2015 edition. The edition was prepared on the basis of DSB's experience since the 2011edition of «Approach to the National Risk Assessments». The 2015 approach is developed with input from collaborators and new development in theory and research on risk analysis and social security.

The 2015 approach to the National Risk Assessments task is that a common approach to risk analysis in the National Risk Image shall ensure consistency in the way in which the different scenarios are analyzed.

The 2015 approach to the National Risk Assessments states that «risk is about future events and is therefore associated with uncertainty». The uncertainty relates to whether a particular undesired event will occur and what the consequences of this event will be. In the National Risk Assessment, the probability is used as a measure of how the likelihood of a particular event will occur within a period of time, given a background knowledge. Since the events analyzed in the National Risk Assessment are considered rare, the probability statements are not only based on statistics, but also on system understanding, academic assessments and local knowledge.

This approach associates with the uncertainty perspective; the risk is the deviations from a reference level (ideal states, planned values, expected values, objectives, and associated uncertainties (R = (C,U)), (Aven, 2012) (Appendix A)).

[5] Nasjonalt Risikobilde (DSB)

[6] Fremgangsmåte for utarbeidelse av Nasjonalt risikobilde

4.2.2 NOU 2016:19

The white Paper NOU 2016:19 «Collaboration for Security - Protection of Fundamental Social Functions in a Changeable Time» is proposed measures for new laws on preventive national security. The purpose of the bill is to facilitate the protection of basic national functions against intended unwanted events such as terrorist acts, espionage, sabotage and other serious crime. The Act provides a comprehensive approach to preventive safety across societal sectors. The law will apply to all organizations critical to basic national functions.

The White Paper describes interaction on different organizational levels with references to the government plan and crisis management tools, the National Emergency Response System (NBS), as specifies specific pre-planned measures and actions which can be implemented to prevent or reduce the amount of injury caused by crises.

NOU 2016:16 describes NBS as harmonized with NATO's Crisis Response System (NCRS), consisting of Civil Emergency Response System (SBS) and Emergency Response System for the Armed Forces (BFF), both of which are owned by section 18 of the Emergency Planning Act, cf. section 3. In addition to the NBS, the Police Emergency Response System (PBS) plays an important role as the police have a key role in civilian crisis management. The white paper further states the fact with the systems harmonized with NATO's emergency response system, ensures good communication between the civil and the military side of Norway's total defense, and between Norway and NATO, by implementing emergency preparedness measures.

The NOU 2016:19 describes risk assessments as the basis for prioritization of risk-reducing measures in most organizations, and that there are different approaches to risk assessments. Traditionally, the white paper states, risk has been defined as a function of probability and consequence of an event, or a set of events, described in the Norwegian Standard 5814: 2008.

The white paper also states that there are several ways to make an assessment of probability and consequence. Probability can be considered using statistical methods if relevant statistics are available, or as a non-statistical knowledge-based assessment if not there is a suitable statistical basis. Combination of Statistical and non-statistical approach can also be used.

With references to both the three-factor model (NS 5832: 2014) and the Defense Research Institute (FFI) report of the two standards for risk assessment (FFI report 15/00923).

The white paper defines risk as «a product of the likelihood that an event occurs and consequence if it occurs. There will be uncertainty attached to both the probability and the assessment of possible consequences». This associated with the uncertainty risk perspective, (R = U).

4.2.3 RISK 2017: Risk and safety in a new time - an assessment of safety and risk in Norway

The Norwegian National Security Authority (NSM) report «Risk 2017» is one of three threat and risk assessments published annually. The other three are published by the Norwegian Directorate for Civil Protection (DSB) and the Norwegian Intelligence Service. NSM uses the terms value, threat and vulnerability in its risk assessments. The risk is defined as the relationship between these three factors. This model is often referred to as the risk factor or the three-factor model.

$$R = \frac{\text{threat to a value}}{\text{The values' vulnerability to the given threat}}$$

4.2.4 The Norwegian Intelligence Service - FOCUS 2017

The Norwegian Intelligence Service (NIS) is Norway's foreign intelligence service. Although subordinate to the Norwegian Chief of Defence, NIS does not concern itself exclusively with military matters. NIS's main mission is to warn of external threats to Norway and high-priority Norwegian interests, to support the Norwegian Armed Forces and the defense alliances Norway is part of, and to assist in political decision-making processes by supplying information of significance to Norwegian foreign, security and defense policy (FOCUS 2017).

Focus is the Norwegian Intelligence Service's annual unclassified assessment of select geographic and thematic areas, with a prognosis for expected developments in 2017. The aim is to present our general assessments of matters which may prove to be of significance to Norway in the year ahead (FOCUS 2017). The Focus report mentioned «risk» 31 times but holds no definition of the concept.

4.2.5 The Norwegian Police Security Service - Threat assessment 2017

The Norwegian Police Security Service (PST) annual threat assessment describes expected development within PST's areas of responsibility in the coming year. In the production, they have been forced to balance the detail and simplicity and clarity of the message. The assessment, therefore, aims to highlight the main features of the most current threats to Norway in the coming year. The target group is Norwegians that wants open information about the expected trends in the threat picture.

In the assessments of politically motivated violence and threats to government officials, they use a set of standardized probability words in their assessment. The purpose is to create a more uniform description of probability in the assessments, thereby reducing confusion and the risk of misunderstandings. The terms and the accompanying description of the meaning of the concepts have been developed in cooperation between the police, the PST and the Armed Forces.

Norwegian term	Description
Very likely	There is very good reason to expect
Probably	There is reason to expect
Possible	It is as likely as unlikely
Slightly likely	There is little reason to expect
Very unlikely	There is very little reason to expect

The PST threat assessment does not go into depth of the concepts of likelihood, probably or possibly.

4.2.6 Meld. St. 14 (2012–2013) Competency for a new era (White Paper)

The Meld. St. 14 (2012–2013) Report to the Storting (White Paper) is a recommendation from the Norwegian Ministry of Defence on 1 March 2013 and approved by the Council of State on the same date (Stoltenberg's Second Government). The white paper founds the basis for competence management in the Norwegian Defence sector (applicable to all agencies). The «Risk» concept is not included as part of the Norwegian document's main text (it appears 5 times in the English version), but appears in a fact box about the response defence, and is expressed in the light of the risk of others in terms of attacks: «Modern capabilities and high responsiveness will give the one who challenges Norwegian security and independence high risk and costs».

4.2.7 Meld. St. 10 (2016–2017) Risk in a Safe and Secure Society (White Paper)

In the Meld. St. 10 (2016–2017) «Risk in a Safe and Secure Society»[7] report to the Storting, The Ministry of Justice and Public Security has prepared an R&D strategy for public security for the period 2015–2019. The strategy highlights the following knowledge needs:

– factors that strengthen society's powers of resistance or resilience
– vulnerability in complex functions essential to society
– risk, risk understanding, and risk acknowledgment
– governance, organization, culture, and leadership of public security efforts
– operative cooperation and coordination
– prevention of terrorism and other intentional acts with high potential to cause harm

The white paper mentioned risk 58 times in the white paper, but holds no definition of the concept. «Systematic follow-up and learning from exercises and incidents is important for improving the ability to handle future incidents. The scale of exercise activity in Norway today is considerable. In recent years a number of evaluations have been carried out of both exercises and incident responses. A key conclusion has been that the learning points keep recurring» (Meld. St. 10 (2016–2017)).

[7] Risiko i et trygt samfunn – Samfunnssikkerhet

4.2.8 Support and Cooperation - A description of the Total Defence today

The Norwegian Ministry of Defence and the Ministry of Justice and Public Security has published the white book with a description of the total defense today[8] (regjeringen.no). The publication focuses primarily on those who work in or are affiliated with emergency preparedness (NRK, 29.04.15).

The report explains the roles and tasks of the Ministries; The Defence Department is responsible for Military Preparedness, the Ministry of Justice and Public Security is responsible for the coordination of Civilian Preparedness and also has significant emergency preparedness resources in its own sector. The Ministry of Defence and the Ministry of Justice and Public Security both have key roles in the total defense. The Government attaches great importance to co-operation, coordination, and interaction between all actors in the emergency preparedness area to make society as prepared as possible to face serious incidents and crises. The report mentions risk 25 times but with no definition of the concept.

«The municipalities shall, according to the Planning and Building Act, consider civil preparedness in its planning, and must ensure that plans for development are implemented in a risk and vulnerability analysis for the planning area. The municipality is responsible for ensuring proper use and protection of areas and buildings. Risk areas or Special hazard areas must be subjected to a special assessment in the area planning and it must be taken adequate consideration for civil preparedness.» («Støtte og samarbeid - En beskrivelse av totalforsvaret i dag (2015)»).

4.2.9 Instructions for County Governors and the Governor of Svalbard

The purpose of the Instructions for County Governors and the Governor of Svalbard's work on civil preparedness, public security, and crisis management, is to provide guidelines for the county governor's work on civil preparedness and for the county governors coordination of crisis management in case of unwanted events. The instruction applies to the county governors coordination of the work on civil preparedness through knowledge and overview of risk and vulnerability, effective and targeted prevention, adequate preparedness and crisis management, restoration of functions of destruction, as well as learning from exercises and events. The instructions apply throughout the phases of peace, crisis, armed conflict and war. The instructions mention risk 12 times but with no definition of the concept.

Comments were made to the county governors instructions on civil preparedness[9] in 2017:

I. Purpose:

«The purpose of the instruction is to facilitate coordination and cooperation to strengthen civil preparedness. This should be done by developing a common planning basis, preventing, enhancing preparedness and ensuring the best possible coordinated handling of unwanted events. There is a line of in the work on civil preparedness from the municipality, through the county governor and regional actors with roles and tasks in civil preparedness and actors to strategic central crisis

[8] «Støtte og samarbeid - En beskrivelse av totalforsvaret i dag (2015)»

[9] Instruks for fylkesmannens og Sysselmannen på Svalbards arbeid med samfunnssikkerhet, beredskap og krisehåndtering

management. In order for this to work optimally, a predictable and equal practice throughout the country must be established. In order to safeguard this line, the instruction clarifies the county governors continuous regional coordination responsibility in the field of social security and preparedness.

In the daily work, the county governor shall facilitate a comprehensive and systematic approach to social security and emergency preparedness in the work, in cooperation with regional actors and in the follow-up of the municipalities.

The county governor shall have a prepared and well-organized crisis organization that can be quickly established to coordinate crisis management and support local and affected actors' handling of unwanted incidents locally.

With unwanted events in this context, events that go beyond the municipalities and affected actors are meant to have the ability and capacity to handle in order to maintain critical social functions and to preserve the life, health and basic needs of the population.» (Chapter XI. Commencement, Comments, §1 purpose).

4.2.10 The Armed Forces Joint Operational Doctrine (FFOD) (2014)

The Armed Forces Joint Operational Doctrine (FFOD)[10] has been prepared at the Defense Staff School (FSTS), the subdepartment of The Norwegian Defence University College (NDUC). The Defense Joint Operational Doctrine (FFOD) 2014 is a continuation of the previous two the doctrines from respectively 2000 and 2007. This the doctrine places more emphasis on planning, implementation, and management of joint operations, and does not have the same role as a textbook in military theory like the two previous ones (Forsvarets fellesoperative doktrine, 2014). «The armed forces need national doctrines to ensure compliance between the Norwegian security and defense policy framework and the use of Norwegian military forces. A Norwegian doctrine will also take care of national specificities, describing conditions not covered in NATO doctrines, clarifying national views deviating from NATO's view and fulfilling their expectations and needs that users of doctrines have.» (- Admiral Haakon Bruun-Hansen, Chief of Defence). The Armed Forces Joint Operational Doctrine (2014) mentions risk 27 times but holds no definition of the concept. The concept is used widely in examples as;

«The Armed Forces Joint Operational Doctrine is the basis for an overall view of The Armed Forces' operational activities, and contribute to a common understanding and terminology.»

«07010. Risk management is a continuous process that takes place at all levels. At the operational level, the process consists in identifying, assessing and handle risks arising from operational factors. Then taken decisions that balance risk costs, such as potential loss or unwanted events, against assignment and potential gain.»

«02105. It takes a long time to build up the combatants' capacity to combat. This is related to the processes associated with material procurement, education and building of the desired moral are complex and time-consuming, while at the same time it must be sufficient balance between the

[10] Forsvarets fellesoperative doktrine (2014)

different factors. If an imbalance occurs here, at the same time, increases the risk of weaknesses an opponent can identify and exploit to his advantage.»

«03017. Preventive security service is facilitation, implementation, and control of preventive safety measures to remove or reduce risk due to security-threatening activities. These measures are regulated in the form of law and form a series of defensive, primarily passive measures aimed at preventing or hampering access for critical assets. Then, measures are taken in the emergency response system on these, with both active and passive measures. Preventive Measures are one of the components of the national emergency response system, and intends to ward off a crisis in an early phase when this is still possible.»

4.2.11 The Norwegian Defense Doctrine for Maritime Operations (2015)

The Armed Forces national doctrines focus´ is to ensure compliance with the Norwegian security and defense policy framework and the use of Norwegian military forces. The Armed Forces doctrines will also take care of national characteristics, describe relationships not covered in NATO doctrines and clarify national views that deviate from NATO as well as fulfill the expectations and needs that doctrinal users have (- Admiral Haakon Bruun-Hansen, Chief of Defence, The Norwegian Defence Doctrine for Maritime Operations 2015). The Norwegian Defence Doctrine for Maritime Operations mentioned risk 31 times, but with no definition of the concept. The concept is used widely and referred in examples as;

«02028. In the 1980s, the war between Iran and Iraq affected global merchant shipping, and the United States and other Western countries conducted both convoy and more offensive operations for to ensure shipping. By 2014, a large number of states, especially in Asia, increased its military force at sea. This may imply probability that war between these states to a greater extent than before will be led to the sea. Many of these states are close to important sea lines of communication. In this way, the risk can also increase in order for global merchant shipping to be affected by a conflict.»

«02036. Svalbard is an undisputed part of Norway. Norway has sovereignty over Svalbard and adopts laws and regulations that apply to the archipelago. Svalbard also has a special status where citizens of all states who have signed the Svalbard Treaty shall have equal rights in terms of business activity. The Continental Shelf around Svalbard is an extension of the Norwegian continental shelf. The Svalbard Treaty applies Svalbard's territorial waters. Some states contest these facts without formal objections. In different interpretations of the Svalbard Treaty's geographical scope, there may be a certain risk of Norwegian policy being challenged. Norway is in other words not without potential challenges as regards the right of disposal of resources in the areas Norway demands.»

«03149. Other conditions that may require attention is the fact that large parts of the mains that connect the European Electrical Supply market is based on transmission via sea cables and, that the world´s Internet traffic is also mainly based on sea cables. Eventual Drivable discoveries of metals on/in the seabed can further contribute attention. Increased shipping traffic through the North Sea route, and possibly in larger parts of an ice-free polar sea and other maritime areas activity could affect national risk assessments related to it maritime environment and safety.»

4.2.12 Strategic Concept for the Norwegian Armed Forces 2009

The Strategic Concept for the Armed Forces (2009) put out the security and defense policy framework for the Armed Forces operative business to build on in the new short-term period. The validity of the defense concept was in line with the long-term plan, but not linked directly to the time horizon for the current long-term plan (2009-2012). The main purpose of the defense concept was to help establish a common and comprehensive understanding of the Armed Forces roles, tasks, and approach. This to create a match between political goals and military means, partly by «..the development of the Armed Forces is based on one Common understanding of what is the Defense justification, but also by the use of military force in accordance with current political decisions and guidelines..» (The Strategic Concept for the Armed Forces (2009), Anne-Grete Strøm-Erichsen, Minister of Defence).

«24. Risks are linked both to man-made and natural-based injuries and consequences. A risk is a product of the consequences that may arise as a result of an event and the likelihood that such an event will take place. Given great mutual dependence In the international system, crises and conflicts that do not concern a country directly nevertheless could have indirect consequences. In this regard, questions will be asked intention of minor importance. A country's security may, therefore, be exposed significant risk without the country facing a direct threat.»

«22. There are close connection and sliding transitions between the three security concepts, and clear dividing lines are hard to draw. This is reflected through a closer and more formalized cooperation between civil and military agencies in the workplace to safeguard social security. The third part of the concept of security must be seen as an aid to describe the changes in the risk picture, and in our adaptation to new one's global challenges and trends. The broad understanding of the concept of security is of major importance for defense policy goals and military tasks can be set to solve. This, in turn, has consequences for the strengths of equipment, equipment training and operating mode, including an increased need for civil-military cooperation, cf. Chap. 4 and 5.»

«25. In assessing risk, damage may be considered a product of the extent of what occurs in connection with the vulnerability of the system. There are events to a large extent to damage a resilient system. An impact that hits or exploits weaknesses may, however, be the limited extent and yet cause great damage. Opportunities to exploit vulnerabilities in a Modern society make up very real security challenges, not least related to Norway's civil preparedness».

«24. The risk is linked to damage inflicted by both man and nature. The risk is the product of the consequences of an event and the likelihood that the event will take place. In an international system characterized by interdependence, crisis and conflicts which are not directed against a particular country may nevertheless have indirect effects. In these cases, intention becomes secondary. The security of a particular country may be subject to considerable risk even when the country is not facing a direct threat».

The Strategic Concept for the Armed Forces (2009) describes risk as the relationship between probability and consequence (probability x consequence, or R = P &C), Thus, this associates with the objective risk perspective (Appendix A, Veland and Aven (2012), Aven, 2012);5.3.6 Norwegian Armed Forces in transition - Strategic defence review (2015) (In the Norwegian Armed Forces in transition - Strategic defense review - by the Norwegian Chief of Defence (Abridged version) Risk is mentioned 5 times, but with no definition of the concept).

4.2.13 The Norwegian National Security Authority - Guidelines on Risk

The Norwegian National Security Authority (NSM) is a cross-sectoral professional and supervisory authority within the protective security services in Norway. NSM provides information, advice, and guidance relating to Protective Security Services with «the purpose to enable protective security with counter threats to the independence and security of the realm and other vital national security interests, primarily espionage, sabotage or acts of terrorism» (nsm.no).

In 2010 The National Security Authority (NSM), the Police Security Service (PST) and the Police Directorate (POD) issued «A Guide: Security and Preparedness Against Terrorist Actions». In this guide, an approach to risk assessment is presented based on «total risk» as «a result of the relationship between the three variables value, vulnerability, and threat» (NSM et al. 2010:17). This risk perspective is coherent with the NS 5832: 2014.

Among other guides and recommendations for risk assessments, NSM has published «a guide to risk management[11] (10.03.15), and a guideline in security and emergency measures against intended unwanted actions («Terrorsikring»). In the «guide to risk management» the concept of «risk» is mentioned 124 times but it is not clearly defined. When categorizing measures for security risk, the definitions derive from NS 5830: 2012 on «Civil Preparedness, Protection against intended unwanted actions, Terminology».

Initially, the guide presents different standards for risk management (1.4): International Organization for Standardization (IMO), Standard Norge (NS series), Committee of Sponsoring Organizations of the Treadway Commission (COSO) ERM, Control Objectives for Information and Related Technology (COBIT) and Information Technology Infrastructure Library (ITIL).

The chapter of security risk assessments refers to the NS 5830 where risk is defined as «the ratio between values, threats, and vulnerabilities» (the «three-factor model»)[12]. The NSM guideline emphasizes that all employees in an organization must know the company security organization, the risk concept and relevant requirements for document security, physical security, and ICT security, and that line managers have an important responsibility in communicating safety-related information to their employees[13].

The NSM guideline in security and emergency measures against intended unwanted actions («Terrorsikring») is based on the methodology of NS 5831 and NS 5832, with main emphasis at NS 5832 (risk is defined as «the relationship between threats towards a given asset and this asset ´s vulnerability to the specific threat»). The guideline mentioned «risk» 75 times but beside the reference to NS 5832, it does not give a clear definition of the concept. The concept of securitisation is defined as «use of security measures when handling risk associated with intended unwanted actions»[14]. The term «security risk» was not defined in the basic definitions in NS 5830, since «security» (risk) is something that was added to the terms later in the NS standard work process, as a compromise to publish the standards (FFI report 15/00923, 4.3.1).

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[11] Nasjonal sikkerhetsmyndighet: Veileder i sikkerhetsstyring

[12] Nasjonal sikkerhetsmyndighet: Veileder i sikkerhetsstyring, 3.3.2 Metode for sikringsrisikovurderinger

[13] Nasjonal sikkerhetsmyndighet: Veileder i sikkerhetsstyring, 4.2 Sikkerhetsansvarlige

[14] Nasjonal sikkerhetsmyndighet:: Veileder i terrorsikring (2015), 1.2 Terminologi

The security risk is defined as an «expression of the relationship between the threat to a given value and the vulnerability of this value against the specified threat», which from a mathematical point of view may mean «low vulnerability provides high risk» (FFI report 15/00923, 4.3.1).

4.2.14 Guidelines for the Police Preparedness (PBS 1)

PBS I (2011) provides guidelines for police preparedness work. «When events threaten central social institutions, our common security or it individual's sense of security, they must be handled efficiently. The handling should be based on clear structures, responsibilities and command lines between emergency preparedness actors. The police have a central role in safeguarding society's security. With it comprehensive responsibility and diversity of tasks it causes, it requires competence, planning, exercises and not least coordination, as well internally as with other actors. The Police Emergency Planning System (PBS) is the foundation of a unified and effective handling of both ordinary and extraordinary events and crises.» (Assistant Police Director Vidar Refvik, PBS I). The Guidelines for the Police Preparedness (PBS I) mentioned risk 46 times but with no definition of the concept. The concept of risk is used widely and referred to in examples as;

«7.1 …Risk assessments shall be part of the planning, implementation, and follow-up of all police operations, also in the operation center. The purpose is to identify possible unwanted incidents and dangerous conditions in work operations, and take action that reduces the danger of unwanted events.»

«6.10.1 The individual port authority is the owner of the security plan and thus responsible to draft and implement it. However, each port may be a risk object that the police must prepare own plans for. It is therefore important that the police have knowledge of security plans for the ports so that they can incorporate these plans into their own plans.»

«6.3.1 A potential terrorist threat, with today's threat, will not be evenly distributed all over Norway, but be limited to some local areas and some sectors of society. The need to implement increased protection and security of objects or areas will, therefore, depend on a specific risk assessment locally.»

«10.3 Risk assessments shall also be included as part of the planning of all police operations.»

4.2.15 The Police Intelligence Doctrine

The Directorate of the Police has seen the need to anchor intelligence as a bearing element of knowledge-based management and as a contribution to the police quality reform. The preparation of Police Intelligence Doctrine is an action to develop this further. The Police Intelligence Doctrine (Police Directorate (2014) defines risk as «the likelihood that something will happen that will have a specific impact (consequence) on an object or phenomenon. A risk is expressed in the likelihood and consequences of actions».

4.2.16 NATO ATP-02.1 NCAGS Guide to Owners, Operators, Masters and Officers

The purpose of the ATP-02.1 NCAGS Guide to Owners, Operators, Masters and Officers[15] is to provide Ship Owners, Operators, Masters, and Officers with information regarding the interaction between naval forces and merchant shipping. In particular, this publication serves as a handbook for the world-wide application of NCAGS principles and procedures that exist to enhance the safety of shipping in times of tension, crisis, or conflict. NCAGS is tailored to support the operational commander's mission in the most efficient and effective way, depending on the character of the actual operation.

The NCAGS structure consists of a permanent element known as the NATO Shipping Centre (NSC), located at the Allied Maritime Command (MARCOM) Headquarter in London, and a number of deployable NCAGS elements that could be deployed depending on the situation and type of operation. Such an element may consist of one or more individuals, or a deployed team holding various roles including those described in the ATP-02.1.

Today, NATO has several approaches to risk in different topics. A NATO project is working to arrive at common methods for NATO (2014) (FFI report 15/00923, 7.1)

In the ATP-02.1 risk is mentioned 23 times but holds no definition of the concept. The concept is used widely in examples as;

«The NSC is also the primary advisor to merchant shipping regarding potential risks and possible interference with maritime operations» (0202 NCAGS Structure; 2.)

«Used in conjunction with a checklist of information required, data gathered via telephone briefings can be vital in assisting the operational commander to assess the risk and, if appropriate, assign assets to investigate. It also helps the master take appropriate action if he is aware of the likelihood of, and timescale for, assistance. (0205 Means of Information Exchange, f;02).

4.2.17 ISO and NS standards

The International Organization for Standardization (ISO) 31000:2009 standard, *Risk management – Principles and guidelines*, provides principles, framework and a process for managing risk. The standard defines risk as «the effect of uncertainty on objectives».

The International Organization for Standardization (ISO) 31000:2009 standard, Risk management – Principles and guidelines, provides principles, framework and a process for managing risk. The standard defines risk as «the effect of uncertainty on objectives».

ISO 31000:2009 provides principles and generic guidelines on risk management. and can be used by any public, private or community enterprise, association, group or individual. Therefore, the guidelines are not specific to any industry or sector. This enables it to be applied throughout the life of an organization and to a wide range of activities, including strategies and decisions, operations, processes, functions, projects, products, services, and assets. ISO 31000:2009 can be applied to any type of risk, whatever its nature, whether having positive or negative consequences (iso.org/ISO

[15] Edition A Version 1 SEPTEMBER 2014

31000:2009). The ISO 31000:2009 approach to risk by associating uncertainty to probabilities is consistent with the uncertainty risk perspective.

Standard Norway is Norway's member of the European Standardization Organization CEN and the International Standardization Organization (ISO) and ensures that Norwegian interests are respected when standards are set internationally. The NS series represents a wide range of national standards for risk analysis, risk assessment and risk management (standard.no). Among these are the NS 5814:2008 and NS 5832:2014.

The Norwegian Standard (NS) NS 5814:2008 «Requirements for risk assessements» underlines communication between relevant internal and external parties as a necessity. This to ensure that the assigner and decision maker has access to all relevant information and their judgments and recommendations are based on a comprehensive situational awareness. The standard recommends all presumptions and simplifications to be considered explicitly reasonable and realistic, and defines risk as an «expression for the combination of probability and consequences of an unwanted event»[16].

NS 5832:2014 «Social Security - Protection against intentional undesirable actions, Requirements for security risk analysis» is a newer standard and defines risk as «the relationship between threats towards a given asset and this asset´s vulnerability to the specific threat»[17]. The Standard is not intended to replace other standards rather than contribute as an alternative approach to risk assessments. The standard defines «pure risk» as «a potential for loss, not profit».This standard is also referred to as the «three-factor model», as it implicitly assesses the the interaction between value, threat, and vulnerability. If the security risk shall be visualized, all three factors must be safeguarded, and any potential profit of risk must be underlined.

In a study, assigned by the Norwegian Defence Estates Agency (NDEA), FFI assessed different approaches to security risk assessments for protection against intentional unwanted actions with the aim to compare the Norwegian Standard (NS) 5814 (Probability and Consistency Approach) and the NS 583X Series (the «three-factor model») (FFI report 16/02319).

Several differences were found in NDEA´s risk approach based on the two standards (NS 5814:2008 and the newer standard NS 5832:2014). One of the differences was how risk was visualized and communicated to the decision makers. The methodology based on the NS 5832 standard approach to assessing the interaction between value, threat, and vulnerability, did not describe nor recommend a perspective or communication of risk (FFI report 2015/00923 p.61).

The study summarized that probability is a key concept in risk analyses and risk assessments but often used without a definition. Several of the respondents FFI interviewed emphasized that lack of a common understanding of the probability concept leads to misunderstandings. The FFI report 2015/00923 report argued for the essence of building a judgemental foundation in a documented way where the uncertainty of the assessments is clearly communicated.

[16] Standard Norge: Norsk Standard NS 5814:2008, §2.5

[17] Standard Norge: Norsk Standard NS 5832:2014, §3.5

4.2.18 The International Maritime Organization (IMO) regulations

IMO – the International Maritime Organization – is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships (imo.org). In 2010, IMO implemented a formal requirement for companies to assess the risks to ships, personnel and the environment arising from their shipboard operations (the ISM Code and Risk Assessment (2010), Convention: SOLAS CH IX ISM Code).

The requirements state that the «requirement to carry out risk assessments should not be interpreted as a meaning that companies must employ a single, formal risk assessment methodology» (ISM Code and Risk Assessment, §3).

The International Maritime Organization underlines that maritime organizations operating in the High North are required to adhere to National and International rules, regulations, and standards for maritime risk assessment, to ensure safe transit and navigation through the harsh environment (imo.org/polarcode).

4.2.19 The International Ship and Port Facility Security Code (ISPS)

Following the 9/11 attack on the USA in 2001, the International Ship and Port Facility Security Code (ISPS Code) was developed as a direct response to threats to ships and port facilities. The approach of the ISPS Code is that securitization of ships and port facilities is a risk management activity and in order to determine which safety measures are appropriate, an assessment of the risks must be made in each case (imo.org/What is the ISPS Code?).

The purpose of the Code is to «provide a standardized, consistent framework for evaluating risk, enabling Governments to offset changes in threat with changes in vulnerability for ships and port facilities through determination of appropriate security levels and corresponding security measures». (imo.org/What is the ISPS Code?).

The ISPS code defines security levels 1, 2 and 3 for port security. The levels are decided by the local government after risk communication with relevant actors and a risk assessment.

The ISPS Code is implemented through a mandatory and a recommendatory part in SOLAS. In Norway, the NCA has had meetings with the police with the aim to inform and improve cooperation between the two organizations in matters regarding risk assessments for securing port facilities (ISPS-NYTT FRA KYSTVERKET 1/2014, p.2).

4.2.20 The European Directive 2005/65/EC

The main objective of the Directive 2005/65/EC of The European Parliament And of the Council, of 26 October 2005 on enhancing port security, is to introduce Community measures to enhance port security in the face of threats of security incidents. Definitions for the purpose of this Directive are (http://eur-lex.europa.eu/legal-content):

1. «port» means any specified area of land and water, with boundaries defined by the Member State in which the port is situated, containing works and equipment designed to facilitate commercial maritime transport operations;
2. ship/port interface' means the interactions that occur when a ship is directly and immediately affected by actions involving the movement of persons or goods or the provision of port services to or from the ship;
3. «port facility» means a location where the ship/port interface takes place; this includes areas such as anchorages, waiting for berths and approaches from seaward, as appropriate;
4. 'focal point for port security' means the body designated by each Member State to serve as contact point for the Commission and the other Member States and to facilitate, follow up and provide information on the application of the port security measures laid down in this Directive;
5. 'port security authority' means the authority responsible for security matters in a given port.

DIRECTIVE 2005/65/EC ANNEX I - PORT SECURITY ASSESSMENT;

The port security assessment is the basis for the port security plan and its implementation. The port security assessment will cover at least:

identification and evaluation of important assets and infrastructure which it is important to protect;
identification of possible threats to the assets and infrastructure and the likelihood of their occurrence, in order to establish and prioritize security measures;
identification, selection and prioritization of counter-measures and procedural changes and their level of effectiveness in reducing vulnerability; and
identification of weaknesses, including human factors in the infrastructure, pol
icies, and procedures.

For this purpose, the assessment will at least: »identify all areas which are relevant to port security, thus also defining the port boundaries. This includes port facilities which are already covered by Regulation (EC) No 725/2004 and whose risk assessment will serve as a basis.» Among the many means, the assessment shall: «identify measures, procedures, and actions aimed at reducing critical vulnerabilities. Specific attention will be paid to the need for, and the means of, access control or restrictions to the entire port or to specific parts of a port, including identification of passengers, port employees or other workers, visitors and ship crews, area or activity monitoring requirements, cargo and luggage control. Measures, procedures, and actions will be consistent with the perceived risk, which may vary between port areas;» (http://eur-lex.europa.eu/legal-content). In the Directive 2005/65/EC, the term risk is mentioned 11 times but with no definition of the concept.

4.2.21 Methods for classifying Norwegian Ports and Port facilities

The Norwegian Defence Research Establishment (FFI) mission is to carry out research and development to meet the requirement of the armed forces, and in particular, focus on development in science and technology that can influence our security policy or defense planning (ffi.no).

In a study assigned by the Norwegian Coastal Authorities (NCA), FFI has established a method for classification of national port facilities, including recommendations to NCA´s risk-based supervision (FFI Report 16/02319). Based upon risk assessments founded in trend reports from the National Criminal Investigation Service (KRIPOS), the Norwegian Police Security Service (PST), the Intelligence Service, and other resources, the study recommends NCA to base their risk assessments in close collaboration with local port authorities. Furthermore, NCA is recommended to train their staff to establish a unified perception of the assessment methodology.

4.2.22 The Norwegian Hull Club - Risk Assessment Models

The Norwegian Hull Club is a mutual marine insurance company, serving its members and clients worldwide. The Club ranks among the largest pure marine insurers in the world, and by many products, the Norwegian Hull Club provides insurance against war perils to their international clients and members. The Norwegian Hull Club acknowledges the importance that the understanding of safety is the same both on shore and at sea, and their Loss Prevention Programme is based on two risk assessment models (norclub.no/The Barrier and Bow Tie Model);

1. The Barrier Model and
2. The Bow Tie Model.

«Barriers are erected in order to avoid accidents and may consist of equipment, processes, procedures, and people. The presence of one or more barriers will, theoretically, be sufficient to prevent an accident. If there is a gap in one or more of them an accident might occur. This often depends on human factors. It is important to be aware of potential gaps and how they can be closed. As mentioned above, non-technical skills often cause these gaps, but they are also highly important in closing them.» ((norclub.no/The Barrier and Bow Tie Model).

4.3 Tabelled summary of associated risk perspectives

The five risk perspectives used to associate prominent risk perspectives:					
Objective	**Uncertainty**	**Non - Probabalistic**	**Chaotic**	**Risk = Perception**	**Did not reply**
R = E, R = P&C	R = C R= C,U	R = E, R = P&C	Not applicable	Not applicable	
The Ministry of Justice and Public Security					
			The Police Directorate		
The Police District of Salten					
			The Governor of Svalbard		
			Joint Rescue Coordination Centre		
			The Norwegian Coastal Administration		
The Port of Mo i Rana					
		NOR VTS Vardø			
	The Ministry of Defence				
			The Norwegian Defence University College		
			The Norwegian Joint Head Quarters		
					The Norwegian National Guard District 14
The Norwegian Coast Guard					
				NATO Shipping Centre	
			NCAGS Norway		
			The Norwegian Shipowners Association		

Table 6: The associated prominent risk perspectives with the different actors

4.4 Empirical Summary

The empirical data identifies that the representative organizations with roles and task to naval cooperation have splayed risk perspectives. This is represented within their own sectors and within the sectoral levels of communication. In overall, the prominent risk perspective seems to be the chaotic risk perspective.

This also applies to the wide span of documents, the white papers, rules, regulations or guidelines. There are many understandings and/or definitions of risk. This may affect assessments and decisions by understanding or perception of their conceptual beliefs/definitions of the concept of risk/risk perspectives. In some cases in the documents, there is no definition or written understanding of the concept of risk at all.

Veland and Aven´s (2012) models of risk communication in light of the associated risk perspectives summarizes how risk assessments can be perceived in the light of the different risk perspectives in the analytical framework. To what extent differences in risk perspectives within the organizations with roles and tasks in naval cooperation can affect risk communication in civil preparedness measures will be discussed in chapter 5.

5. Discussion

The empiricism has identified that there is indeed a mix of various ideas and risk perspectives within the investigated organizations. The chapter 5.1 discusses how the different organizations can affect risk communication by their risk perspectives. Finally, Chapter 5.2 uses the DSB scenario with a military invasion of northern Norway to illuminate possible effects of the research question; to what extent can the differences in risk perspectives within the investigated organizations affect civil preparedness in the high North.

The police directorate has not prepared an explicit definition of the term risk. Risks are assessed and estimated in a number of areas in the police, eg. Linked to HSE, within the field of prevention, at elevated threat, etc. Furthermore, assessment of risk is an important part of planning, implementation and follow-up of police operations.

- The Directorate of the Police
(Appendix D - Questionnaires)

«The Governor of Svalbard has not defined risk as a concept. We see this as a weakness, and that we should include this in future plans and working documents to ensure a common situation understanding with cooperating partners. Initially, we see a need to conceptual risk in the Preparedness Council.»

- The Governor of Svalbard
(Appendix D - Questionnaires)

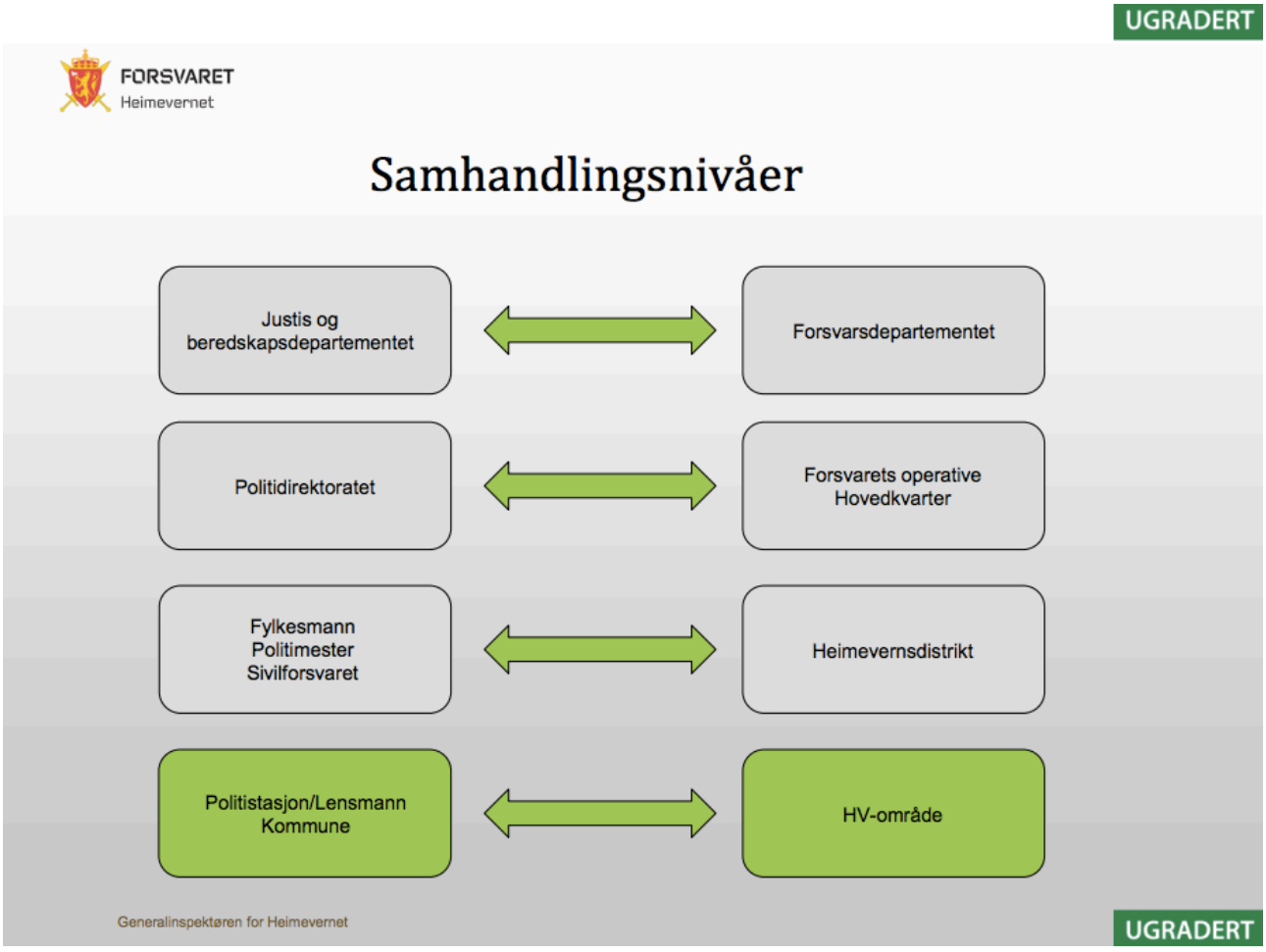
The term RISK is not specifically defined in NATO doctrines. RISK and THREAT are frequently used as synonyms and closely linked to VULNERABILITY.

- NCAGS Norway
(Appendix D - Questionnaires)

5.1 How the different organizations can be affected by risk communication

The empirical data identifies that the representative organizations with roles and task to naval cooperation have splayed risk perspectives. This is represented within their own sectors and within the sectoral levels of communication. Based on the five risk perspectives, the overall prominent risk perspective seems to be the chaotic risk perspective. Although there are different risk perspectives within the various main organizations, this will, in fact, be a chaotic risk perspective itself because the main organization with subordinate departments will have a mix of ideas and concepts of risk.

The investigated organizations have many communication levels, which means that risk communication can produce effects both internally and between the different organizations. Examples of how the various organizations cooperate are illustrated both in the organization chart of the JRCC and through the county governor.



Picture 4: Example of interaction levels between the investigated organizations (Picture: fylkesmannen)

As there seems to be an overall mix of ideas and concepts of risk, the risk communication in relevance to the analytical framework will be pointless. If the concepts of probability, uncertainty, and risk are not properly understood, and there is no scientific perspective to support or assess the risk analysis, can neither values or terms as expected values be interpreted?

In the chaotic risk perspective, likely the analyst will fail in providing a credible risk assessment, however, the decision maker has no prerequisites to judge the validity of the assessment. If the analyst presents a risk matrix and the values of the risk acceptance criteria not being reflected in a scientific perspective, the decision maker could, in turn, be affected by the color regime in the matrices rather than questioning the criteria for risk acceptance.

Chapter 2.4 presented tables upon the effects of risk communication in light of different risk perspectives (Veland and Aven, 2014). The tables summarized Veland and Aven's main findings in how risk assessments can be perceived in the light of the different risk perspectives in the analytical framework. The investigated organizations have different risk perspectives in which the risk communication effects can be assessed from the tables. The following subchapters will assess how risk communication can be affected by the associated risk perspectives.

Scenario 1: A risk analyst presenting the result to a decision maker

If the analyst and the decision maker has a chaotic risk perspective (The Police Directorate, The Governor of Svalbard, Joint Rescue Coordination Centre, The Norwegian Coastal Administration, The Norwegian Shipowners Association), this will in practice lead to «a completely meaningless communication between these actors» (Veland and Aven 2014). This means that what is communicated from the decision-maker can be carried out in measures that are not appropriate to the real threats or opportunities that the risk represents and that all measures taken can in fact be random. In order to establish a meaningful communication, the risk analyst needs to establish a scientific based risk perspective.

If the decision maker has the chaotic risk perspective (The Police Directorate, The Governor of Svalbard, Joint Rescue Coordination Centre, The Norwegian Coastal Administration, The Norwegian Shipowners Association) but the risk analyst has the objective, the uncertainty or the non-probabilistic risk perspective (The Ministry of Justice and Public Security, The Police District of Salten, The Port of Mo i Rana, The Ministry of Defense, NOR VTS Vardø, The Norwegian Coast Guard), risk communication can provide positive effects depending the analyst ability to express the probabilities and uncertainties to the risk assessment. In order to develop a mutual understanding of the terms and concepts, a process for risk communication must be defined.

If the decision maker has the objective risk perspective (The Ministry of Justice and Public Security, The Police District of Salten, The Port of Mo i Rana, The Norwegian Coast Guard)
and the analyst holds either the uncertainty (The Ministry of Defence) or the non-probabilistic risk perspective (NOR VTS Vardø), this can cause confusion because the objective risk perspective expects a «true» risk. In order to the decision maker to understand and recognize to the analyst's perspective there is a need for a clear methodology in the risk communication.

Scenario 2: An expert providing risk related input to a risk analyst

If the expert has a chaotic risk perspective (The Police Directorate, The Governor of Svalbard, Joint Rescue Coordination Centre, The Norwegian Coastal Administration, The Norwegian Shipowners Association) and the risk analyst an objective view (The Ministry of Justice and Public Security, The Police District of Salten, The Port of Mo i Rana, The Norwegian Coast Guard), the expert can experience the risk analyst as not being open to alternatives to an objective risk. In order for the expert to understand the risk related input, the analyst needs to explain the relevant terms and concepts and request information in a format suited for the assessment.

If the expert has the objective risk perspective (The Ministry of Justice and Public Security, The Police District of Salten, The Port of Mo i Rana, The Norwegian Coast Guard), and the risk analyst the uncertainty risk perspective, (The Ministry of Defence), this could lead to a discussion on fundamental issues about how to understand and describe risk. In order for the expert to provide input in the format required, the analyst needs to clearly communicate the approach and thinking of the risk assessment.

If the expert has the objective risk perspective (The Ministry of Justice and Public Security, The Police District of Salten, The Port of Mo i Rana, The Norwegian Coast Guard) and the analyst a non-probabilistic risk perspective (NOR VTS Vardø), and the expert lack knowledge to the rationale of non- probabilistic methods, this can cause conflict in the communication. In order to prevent communication error, the analyst needs to explain the relevant terms and concepts, and also need to request information in an expedient format.

Scenario 3: A risk analyst presenting results to lay people

If the analyst have a chaotic risk perspective (The Police Directorate, The Governor of Svalbard, Joint Rescue Coordination Centre, The Norwegian Coastal Administration, The Norwegian Shipowners Association), communication to the lay people could fail to provide a credible response to public criticism. In order to provide a trustworthy communication, the risk analyst needs to establish and communicate the scientific based risk perspective of the assessment

If the risk analyst has the objective risk perspective (The Ministry of Justice and Public Security, The Police District of Salten, The Port of Mo i Rana, The Norwegian Coast Guard) and the lay people holds a risk = perception perspective, the lay people will question the basis that the results are built upon. It is likely, the lay people will argue and debate the trust to the assessment if the objective results are used to conclude on risk acceptability. In order to provide thrustworthy answers to public criticism, the risk analyst needs to express that there is recognized a difference between the underlying risk of the assessment and its estimate with associated uncertainties, in order to gain the trust of lay people.

If the risk analyst has the uncertainty risk perspective (The Ministry of Defence) and the lay people a risk = perception risk perspective, a broad risk picture is presented reflecting the knowledge and lack of knowledge, which could cause a public question the quality of the analyses, ironically because of the expressed lack of knowledge. In order for the public to gain trust to the assessment and for the analyst to overcome scepticism, the risk analyst needs to clearly establish and communicate a clear and consise a strong scientific platform for his/her thinking.

Scenario 4: A decision maker communicating with lay people

If both have a chaotic risk perspective (The Police Directorate, The Governor of Svalbard, Joint Rescue Coordination Centre, The Norwegian Coastal Administration, The Norwegian Shipowners Association), communication could be meaningless. The decision maker could fail in providing a credible response to public criticism. In order to providing a credible response to public criticism, the decision maker needs to establish and express the scientifically based risk perspective of the assessment in a clear and consise matter.

If the decision maker has the objective risk perspective (The Ministry of Justice and Public Security, The Police District of Salten, The Port of Mo i Rana, The Norwegian Coast Guard) and the lay people have a chaotic or risk = perception perspective on risk, the likely response from the lay people could range from full trust to a total lack of faith towards the decision maker. In order to gain the trust of lay people, the decision maker needs to acknowledge the difference between the underlying risk and its estimate with associated uncertainties.

If the risk analyst has the uncertainty risk perspective (The Ministry of Defence) and the lay people have a chaotic or risk = perception risk perspective, too much focus on uncertainties might raise doubt to the decision. In order to provide the lay people's trust, the decision maker should strive to communicate a balance between uncertainty and knowledge to the assessment.

Scenario 5: An analyst assessing the safeguarding of a vessel to a decision maker

The case of safeguarding the USS Leyte Gulf refers to an event which happened in May 2017. As a part of a naval exercise, the US Cruiser «USS Leyte Gulf» was docked in the port of Tromsø. Several voices raised criticism on the Norwegian contribution to safeguarding the security of the US military vessel, a hired unarmed, 20-foot leisure boat (Aldrimer, 04.09.17). In order to carry out the assessment (say), the NJHQ requests a risk assessment from the police intelligence service. How different risk perspectives might have affected risk communication in the case of USS Leyte gulf stands as an example in table 7 and 8.

Situation		Analyst	Decision maker	Effect
1	Both actors have a chaotic risk perspective	The analyst will fail in communicate the message of the assessment.	The decision maker will fail in entrepreting the values in the assessment.	An unarmed, 20-foot leisure boat was considered sufficent means of safeguarding the vessel.
2	The analyst has an objective, uncertainty or non-probabilistic perspective, the decision maker has the chaotic perspective	The analyst fail to express associated uncertainty in the assessment	The decision maker do not recieve a comprehensive risk assessement	An unarmed, 20-foot leisure boat was considered sufficent means of safeguarding the vessel.
3	The analyst has the uncertainty or non-probabilistic perspective, the decision maker has an objective perspective	The analyst presents the scientific perspective of the assessment	Expectations about an objective risk raises doubt to the validity of the assessement	An unarmed, 20-foot leisure boat was considered sufficent means of safeguarding the vessel.

Table 7: Risk communication effects of situation 1, 2, 3

In the situation 1 both actors in table 7 has the chaotic risk perspective, meaning a lack of scientific foundation upon the results of the risk assessment, that the risk assessments and decisions are not founded in a scientific approach, or, that the perception of risk holds a mix of various ideas about the concept.

If considering risk communication effects of the risk concept in relation to the time dimension (figure 1), situation 1 implies both actors have mixed ideas about on the time interval (eg. s = D) and where cs would refer to a set of quantities that are introduced to characterise the events a and consequences c in the period of interest. The preconditions and the base for communicating and interpretative quantities are poor. If the analyst fails to interpret and communicate values or if the decision maker does not hold a scientific premise to analyze an assigned probability in the risk assessment, this could lead inadequate decisions.

Another aspect is the knowledge of risk acceptance criteria and the associated assumptions of the analyst. If the decision maker does not hold presumptions to identify a gap between a risk-based «benchmark» and the quality of the analysis, this could result in a communication where the analyst

and the decision maker might cause negative effects in relation to establishing risk barriers to an unwanted event.

In situation 2, the analyst has an objective, uncertainty or non-probabilistic perspective, the decision maker has the chaotic perspective. This situation is considered realistic as an analyst would hold scientific knowledge of the risk field, whereas a decision maker normally lacks such training (Veland and Aven, 2012).

If considering risk communication effects of the risk concept in relation to the time dimension (figure 1), situation 2 implies that the analyst has either s = d1 (the objective risk perspective) s = d2 (the uncertainty perspective) or s = d1 (the non-probabilistic perspective), while the decision maker has eg. the time = s (now).

If the analyst is aware of the decision makers premises for judging the analysis and avoids the scientific explanations to simplify the assessment, the decision maker might not be aware nor consider there is an option to the «true» assessment. Considering the decision makers time dimension s (say), the decision might focus on the present situation and neglect associated uncertainties to the time dimension s = d2.

In situation 3, the analyst has the uncertainty or non-probabilistic perspective, the decision maker has the objective perspective. If the analyst puts emphasis on the s = d2 time dimension and associates uncertainties to the assessment, the communication to the decision maker could fail because he or she would expect a risk assessment based on objective probabilities related to the time dimension s = d1.

After facing criticism for the safeguarding of USS Leyte Gulf, the Armed Forces increased its presence when the ship returned to its second port visit a few weeks later (Aldrimer, 04.09.17). Despite the increased presence of force protection on the second port visit, according to the Norwegian Joint Head Quartes, the force protection they provide to allied vessels is based on the same threat assessment and was considered as sufficient as the first port visit by USS Leyte Gulf. Both assessments were carried out by the same department (Aldrimer, 04.09.17).

In situation 4, at time = s, future events are not known. But given the attention of the safeguarding of the vessel at the previous port visit, the uncertainties have gained attention and the assessor has also moved forward in time to time v (figure 1) and now has updated knowledge which affects the decision.

In light of criticism, knowledge of risk mitigating measures (options) to an unwanted event, like (say) eg. a terrorist attack on the ship from the seaside. Uncertainty to the first assessment is influenced by data and information gathered since s, and at time v, knowledge or awareness of consequences of neglecting the probability of an unwanted event in the time dimension s = d2 are non-negligible to the analyst and/or the decision maker (table 8).

Situation		Analyst	Decision maker	Effect
4	The analyst has a non-probabilistic perspective and the decision maker the uncertainty perspective	The analyst fail to present the scientific perspective in the assessment but has raised awareness to stochastic variables in the assessment	The decision maker identifies some relevant and interesting points, but the overall poor presentation neglegt weight to the findings but focus on the time dimension s= d2	The vessel has increased force protection with two Norwegian combat boats (SB-90N) and a significantly stronger force protection is safeguarding the vessel.

Table 8: Risk communication effects of situation 4

Even if the case of safeguarding the USS Leyte Gulf is simplified, it serves as an example of how risk perspectives might affect risk communication. The example can be used to assess risk communication, but to fully understand assessment and decisions one should also identify factors that might affect risk assessments and risk communication. The risk communication effects (table 7-8) should be seen in conjunction with the risk concept in relation to the time dimension (figure 1 and figure 2).

5.2 The research question

To what extent can the differences in risk perspectives within the investigated organizations affect civil preparedness in the high North ? When making decisions, it is often based on advice and expert reviews. Politicians manage community benefits on behalf of the population. Decisions they take are often influenced by expert statements. Similar processes also occur between organizations in naval cooperation and also applies to mechanisms of civil preparedness.

Sometimes, even if there is identified and communicated a risk, the risk is considered acceptable compared to the cost-benefit of implementing compensating measures. Reasons that risk is considered acceptable may lie in the risk perspective that assesses and communicates the risk. For example, the objective risk perspective is considered a retrospective perspective, where emergency preparedness measures are often implemented after an unwanted event has occurred to prevent any similar occurring. If an analyst presents an assessment based on this perspective, emergency preparedness measures may not be dimensioned against possible future events. This is because the assessment basis is based on statistical events and therefore the risk is considered as a «true» risk.

The thesis has not investigated how the different organizations assess risk by methods, but as a general assumption, the simplified or standard-based method is considered the most common while a model-based risk assessment often requires advanced models and techniques eg. Bayesian models. The advanced model would require depth knowledge to eg. math and this could, in turn, draw a vulnerability to decisions, especially in situations where there is lack of competence to assess the methodology.

Often when in doubt of consequences and as a supportive tool for decision-making, principles like cost-benefit or cost-effectiveness are used. When weighing costs for establishing measures that are considered to be unlikely, cost effects may be due to the fact that the assessment basis is based on statistical events and therefore the risk is considered a «true» risk. When weighing costs for establishing measures that are considered unlikely, cost-effective or cost-benefit principles may weigh in favor of not implementing or discontinuing resource-intensive measures. Thus, an objective risk perspective may affect a decision in disability of proactive measures.

The questionnaires and the documents studies have not identified decision-making principles as referenced supportive tools for risk management or related to the terms of the cautionary principle, precautionary principle or the ALARP principle. However, in the white paper of NOU 2016:19 (Collaboration for Security - Protection of Fundamental Social Functions in a Changeable Time), cost-effective regulations are described as concepts ensuring a balance between acceptable residual risk and the cost of the security level. Socio-economic profitability should be a basic prerequisite, ie. «current hedging measures must have a socioeconomic benefit that together exceeds the cost». This means that if a risk is not properly communicated and understood, cost-effective regulations could overrule the need for civil preparedness because the risk is communicated and/or understood as acceptable in relation to the cost.

During the cold war era, civil preparedness were aimed at war and crises of similar magnitude and severity as the two World Wars . The experience of previous wars and blockades also meant that the measures should be barriers to prolonged supply crises due to a real shortage of goods. Grain for flour production and sugar were considered as critical goods, and grain and sugar stocks were built

on public funding. In the years to follow after WWII, given the fact that the war indeed was over, even decades later, the civil preparedness was aimed to serve as a foundation for the total defence. As the threat faded away in the horizon, the civil preparedness was gradually downsized. Eg, the requirements for emergency preparedness of food of 1928 where the inventories should cover one year's consumption grain was changed to cover six months normally consumption in 1995.

In 2003, the scheme for emergency preparedness of food was terminated and replaced with a limited stock arrangement for flour, equivalent 20-day consumption of flour for the bakery industry north of Ofoten. The scheme of emergency storage of grain and flour became however discontinued in 2014. Since 1990, the authorities have not found it appropriate to provide detailed recommendations on self-preparedness for food. Since there is no longer a grain storage in Norway, it should not be considered a surprise, or, a black swan, if the scenario of a military invasion in northern Norway would lead to food buttoning (eg. unknown - known events, which are events unknown to many but known by few, Aven 2014). Aven (2014) argues the key to meet and understand risk, as well as black swans, is based in the knowledge dimension, taking into account *«the discourse of variation and unpredictability as well as the conceptual aspects of risk and uncertainties»*. This meaning that risk assessments anchored in the past do not tell stories about the future and therefore the future indeed is unpredictable and decision-making principles should take this into consideration and search for new knowledge (time s = d2) to reduce uncertainty.

In relevance to naval cooperation, sufficient quantities of grain, food, and fuel can only be transported by ship to meet the demand of the scenario. 80% of Norway's coastline is above the Arctic circle and the maritime activity in the region is significant (cover picture: density map of ship traffic in the high North). An event of hampered freedom of navigation in the scenario of a military invasion in the high North would require a significant demand for supplies that in turn need a robust civil preparedness. In order to ensure a high level of civil preparedness, risk assessments in order to have ports to have sufficient resources for reloading so that goods can be transported unimpeded to the destination. It requires that there are sufficient resources to protect both ships and ports and it requires resources to assess and communicate the situation. Preferably before such a situation occurs.

In 2015, experts said that Norwegian municipalities and counties are not prepared for a military crisis and that civilian preparedness must be strengthened. *«Civilian preparedness has gone into oblivion. Emergency shelters and logistics are largely absent»*, said Admiral Trond Grytting, who has been part of a government-appointed expert group who presented their advice to the defense minister (NRK 29.04.15). The debate is not new, and experts at the University of Environmental and Life Sciences in Norway has already argued their belief, that Norway in a crisis will have a good ability to import grain (Aftenposten 12.10.11).

In the choice of two alternatives, eg. spending money on matters for facilitating grain storage or coordinate organizations to ensure effective handling of logistics and food in a possible scenario or saving money, it may be «politically wise» to choose the cheapest option in the short term. Today, Norway is less than 50% self-supplied of food (VG, 09.02.17), in fact, Norway imports between 80 and 90 percent of all grain products (NRK, 19.09.12).

A 2003 report from FFI assessed that the national logistics system will face severe consequences in a war (DSB 2017). Roads, harbors and storage facilities could be destroyed as a result of acts of war, and that it is, therefore, necessary to take into account alternative transport routes (ships). This

is an example of risk communication in which actors with roles and tasks for naval cooperation must consider their responsibility. In order to maintain their role in civil preparedness, organizations with roles and tasks in naval cooperation must assess and communicate risk in such way that decisions are made on solid ground. Eg., if the organizations to collaborate on civilian preparedness base their measures in crisis (time s = d2) on risk assessments made in a (say) objective risk perspective in peacetime (time s = d0), this may lead civil preparedness not being ready to handle stress without additional help from outside because the preparedness does not foresee the probability of possible future consequences or the and uncertainties associated with the larger than the cost-benefit principal.

In the scenario of a military invasion in northern Norway, foreign forces are deployed in several areas and cities. Warships from state X patrol along the coast of northern Norway and combat aircrafts controls the air domain in the same area. Without a military escort, it will not be possible to maintain normal transportation in areas where acts of war are being taken. Access to roads and ports will also be uncertain and transport personnel will be exposed to high risk. Even though the authorities have established food stocks, the question remains about how the distribution should be organized in an area where war operations are taking place. The relocation of Allied soldiers to northern Norway will require large amounts of fuel either by landing, by air or at sea.

In a normal situation, Norway will have sufficient fuel from the Mongstad and Slagentangen oil refineries and regional deposits of fuel, including in Oslo. In the scenario, access to fuel is reduced due to the war actions. In a situation of shortage of fuel, it is assumed that the military relocation will be prioritized at the expense of private carriage. Transportation of fuel in adequate quantities is only possible by ship. If decision-making principles have been used for assessing, for example, building down preparedness stocks for eg grain, food, consumables or fuel, this requires that the principle of freedom of navigation be maintained.

In decision making, an example of the use of color terminology in risk communication between organizations appeared in March 2017. The Norwegian government was questioned by the Office of the Auditor General («riksrevisjonen»), claiming the collaboration between the Ministry of Justice and Public Security and the Ministry of Defence, to protect key national institutions using security forces and physical measures, was inadequate (NRK, 22.03.17). In their response, the Government explained that they did not understand the comprehensive state of emergency. In their communication with the other Ministries and Departments, their perception of implemented adequate risk measures was «green». «When the Police Directorate announced «green» and notified the Parliament that object security goals were met, it was based on wrong information», said the Prime minister.

If the analyst and the decision maker has a chaotic risk perspective, this means that what is communicated from the decision-maker can be carried out in measures that are not appropriate to the real threats or opportunities that the risk represents and that all measures taken can in fact be random. If the decision maker has the chaotic risk perspective but the risk analyst has the objective, the uncertainty or the non-probabilistic risk perspective, risk communication can provide positive effects depending the analyst ability to express the probabilities and uncertainties to the risk assessment. If the decision maker has the objective risk perspective and the analyst holds either the uncertainty or the non-probabilistic risk perspective, this can cause confusion because the objective risk perspective expects a «true» risk.

When ships can no longer navigate freely, or when there is a need for supplies, the concept of naval cooperation comes into force. Naval cooperation is not just a concept of ship-to-ship talking together, but a concept for ensuring that the wheel of society is moving around, maintaining civilian preparedness, and facilitating allied reception on which the defense concept is established (the concept of «total defense»). This requires that all organizations ith roles and tasks for naval cooperation have the ability to assess and communicate risk appropriately so that decisions are taken on the best possible basis.

The theoretical approach to the empirical data is based on perspectives and theories of risks that challenges established risk perspectives. As the subject of risk management is a young concept itself, questioning the organization's definitions or understandings of risk with «new» perspectives might be considered as the thesis addresses an arrogant dissection of their compliance with eg. the NS standards. The summary of prominent risk perspectives shows a general «chaotic» conceptual understanding of the risk concept in, and between the various organizations. This may raise doubt to the thesis reliability, by the general trust to that governmental organizations have adequate risk management and vulnerability models is likely greater than the validity of a skeptic thesis?

The theoretical foundation of the concept of risk has been studied for centuries and the recognition amongst laity of a «true» risk is common, even amongst experts (Aven, 2007), however, also the chaotic perspective is considered a common perspective within all kind of actors (Veland and Aven, 2012). The FFI report 15/00923 assessed different approaches to security risk assessments for protection against intentional unwanted actions (security). The objective was to compare operationalization of the standards NS 5814: 2008 with the NS 5832: 2014. The report interviewed individuals from various risk management environments. Although these individuals are considered as leaders in the field of study, they also represent these different perspectives on risk.

«I, with many of my colleagues from the University of Stavanger, have talked about knowledge-based probabilities for many years, still there are many from the security-sector that does not understand what this means. They will often understand probabilities like frequency-based, where the probability is «the relative frequency of an event occurs in a hypothetical situation that repeated an infinite number of times».

…This is a total bummer! It's hardly anyone who knows the field of risk that adheres to using frequency-based probabilities in the security area. This reveals a lack of knowledge about the risk profession.»

Terje Aven (UiS), FFI report 15/00923

«There are several standards that look at risk management in a more general perspective, but the ISO 31000 standard has often been referred to in recent years. The goal is to find the balance of what you want to achieve and what you want to avoid and which can threaten your goal to achievement. This applies to both intentional and unintended events. NS 5814 is quite close to ISO 31000. It's not identical, some things are different, eg. risk acceptance criteria is clearly highlighted in 5814.

Also, the definition of «risk» in ISO 31000 differs from NS 5814. This is unfortunate and it is a sign that the concept of risk management is relatively young. I know that when they wrote the ISO 31000, they changed the definition of risk at the end. This is quite drastic and sensational, considering the entire standard deals with risk management.»

- *Willy Røed (UiS), FFI report 15/00923*

«I would say that the most basic principles of NS 5814 are that it is based on history and empiricism. I'm not negative to NS 5814, I think it's a fantastic method for unintentional events where you do not have people who want to hurt you. You can also use the NS 5814 for Intentional actions if you have a good empirical basis. For example, at Karl Johan, you may have 50 events of shattering magazine windows that cause theft of goods from stores. This may form a good probability basis to say when it will 2happen to, for example, your store. Then It's great to use this method, but when it comes to low-frequency events, the method in my eyes is useless.»

«The Boston square matrix is very easy to understand, with colors that show what's safe, uncertain and dangerous. It's easy for management to make a decision and say that «we have 10 scenarios on green and one on red and how much does it cost to handle the scenario in red - 10 million, fine, fix it now». Then you are done in the 5 minutes you had with the director. This method has been used and shown so many times that it is understood intuitively.»

- Thomas Haneborg (PST), FFI report 15/00923

The many examples of different risk perspectives in the FFI report 15/00923 correlate with the empirical data, which observes differences in risk perspectives within the investigated organizations. Chapter 2.3.6 discuss an example of how different risk perspectives in risk communication in Norwegian municipalities can cause consequences to their resilience to extreme rainfall. In a political system, as in politics, cost-effective policies could budget less money to civil preparedness measures to handle preparedness measures if they are based on a retrospective perspective (the time dimension d0 - d1).

The Act of Civil Protection determines that the municipality is obliged to map which unwanted events as may occur in the municipality, assess the probability in order for these events to occur and how they are in that case, it may affect the municipality. The result of this work must be assessed and assembled in a comprehensive risk and vulnerability analysis. Based on the risk and vulnerability analysis, the municipality must prepare a contingency plan which shall contain an overview the measures the municipality has prepared to handle unwanted events. Provisions on municipal risk and vulnerability analysis and contingency plans are concrete in regulations on municipal contingency duty and affect the civil preparedness measures in which organizations with roles and tasks for naval cooperation must rely on.

In 2002, on behalf of the Norwegian Ministry of Trade, Industry and Fisheries, a risk and vulnerability analysis assessed food supply to northern Norway (DSB 2017). The analysis concluded that supply failure would not be a significant problem either during times of peace, tension or conflict. In relation to the time dimension (considering this assessment in relation to the time dimension s = d0), the prerequisite for the 2002 Risk and Vulnerability analysis was a strategic notice period of at least two years for invasion of Norwegian territory.

This was a reasonable assumption in 2002 (s = d0), but now (at time s= d1), the security policy situation has changed so that the estimated notice period is reduced. This means that the assumptions as in 2002 were added reasonable for preparedness has changed and may no longer valid due to new knowledge. As the assessment of 2002 resulted in downscaling the armed forces as well as civil preparedness measures, risk-mitigating options are now reduced (figure 2). Retrospective, if the assessment focused on associated uncertainty to the time dimension s= d2, the effect of the now by-passed long-term plans for the armed forces or for civil preparedness measures would maybe have been different with eg. continuation of grain storage.

The DSB 2017 assessments have not been quality assured by the use of experts. For example, there have been no meetings with the Armed Forces or agencies in the transport sector, also in which are related to tasks and roles to naval cooperation (DSB 17, table 19. p. 94). This may cause an error to the empiric data, as it is founded on the scenario in the DSB 17 report. Other plausible sources of error for the analyzes may be that the questionnaire is too simple and that it is simply not possible to identify a prominent risk perspective based on three simple questions. Another source of error might be that the document studies do not provide sufficient insight into the organizations' interpretations or practices of risk management or risk communication. It is also uncertain whether it is as easy to draw conclusions about the effects of risk communication in the interaction levels at a macro level like a Meso or micro level.

To what extent the above errors can affect the prerequisites to the thesis is highly uncertain, as any such events are future. The extent of a military invasion in northern Norway, what time of year and duration of the attack are critical prerequisites for the research question. To what extent the scenario leads to fighting on land, sea or airspace and to what degree critical infrastructure and critical social functions are affected will also cause effects. In the time dimension s= d2, the thesis is sensitive to the premise of freedom of navigation with manned merchant ships. In a not so futuristic scenario with the use of eg. autonomous ships, the premises for effects might change.

The DSB 2017 assessment states there are no known or identifiable threats to food supplies in relation to the scenario of a military invasion in northern Norway. The report states that the very low threat level indicates a very low probability. The assessment is based inter alia on the fact that the intergovernmental relationship between Russia and Norway historically, and in recent times, has been characterized by an absence of armed conflict. Issues and disagreements relating to border relations and resource management have been resolved through agreements between the countries. Under this presumption, effects of different risk perspectives within the investigated organizations might cause little effects to civil preparedness.

The scenario of a military invasion in northern Norway has a number of assumptions about changes in foreign and security policy conditions as the basis of the scenario. The probability of the scenario is estimated to be 0-10 percent in the course of 50 years, that is, very low, indicating how likely it is

to the scenario will occur and based on available information and data. Thus, different concepts and definitions in maritime cooperation may have minor effects on civilian preparedness.

On the other hand, the probability ranges used in the scenario of a military invasion in northern Norway are based on the definitions in the Police Intelligence Doctrine (Police Directorate (2014). The Police Intelligence Doctrine defines risk as «the likelihood that something will happen that will have a specific impact (consequence) on an object or phenomenon. The risk is expressed in the likelihood and consequences of actions».

Hopefully, we will not be known what was a «right» risk perspective. But it may be that an investment in common conceptual clarification is what is needed to give the greatest impact on civil preparedness in the high North.

6. Conclusion

To what extent can differences in risk perspectives within organizations in naval cooperation affect risk communication and civil preparedness measures?

There is no true answer to the research question. The empiricism implies an overall chaotic perspective on risk within the investigated organizations. This applies to the questionnaires as well as the numerous documents, regulations, guidelines, and directives, also to the different organizations from the top level, to the educational system and at the operational level. However, more research is necessary to determine if there really are many different perspectives on risk and to what extents such differences might cause effects.

If the investigated organization´s risk assessments are made upon mixed concepts of scientific perspectives and if the decision maker does not hold sufficient knowledge to analyze the assessment, the consequence might be that risk-mitigating factors prove insufficient to ensure civil preparedness objectives in the high North in regards to the DSB 2017 scenario of a military invasion in northern Norway.

There are many factors which affect risk communication within the organizations with roles and tasks for naval cooperation, in which lack of knowledge and a common use of terms and definitions seem to be the main component. With a dynamic risk picture and in order to mitigate risk, it is necessary that we have a modernized and comprehensive common understanding of preparedness concepts and knowledge of cross-institutional organizations conceptual use of concepts and definitions in preparedness. The ability to deal with crises in peacetime is a prerequisite for dealing with complex and long-term emergency situations, as well as security policy crises and war. Therefore, a common, conceptual use of the term and the definition of risk in the organization's roles and tasks in naval cooperation work on civil preparedness is important, because the absence of a common understanding represents a vulnerability to civil preparedness.

The thesis holds consensus with the risk and vulnerability analysis of Norwegian food supply, which concluded that the greatest weakness is associated with the delegation of responsibilities between actors. The thesis also holds consensus with the the Norwegian Ministry of Justice and Public Security 2016-2017 report to the Parliament, that emphasizes that the need for common understanding of preparedness concepts, knowledge of cross-institutional organizations conceptual use of concepts and definitions in preparedness is a prerequisite for understanding and interaction in preparedness and crisis response (Meld. St. 10 (2016–2017)).

There is associated uncertainty to the empirical data. However, If the findings are valid, in the scenario of a military invasion in northern Norway the ultimate effects of different risk perspectives within the investigated organizations could leave us all at sea.

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Appendix A - The Scenario of a military invasion of Northern Norway

The scenario of a military invasion in Northern Norway is rendered in its entirety from the DSB 2017 report «Risk and vulnerability analysis of Norwegian food supply»:

New ice-free sea roads and access to valuable resources as oil, gas, minerals and fish increses the battle for the continental shelf under the polar sea. The area contains 30 percent of the world's undiscovered gas resources and 15 percent of the undiscovered oil resources.

Regarding the Arctic Ocean itself, this will be international waters the day the ice is melting. Norway, Russia, Canada, Denmark (via Greenland) and the United States (via Alaska) make up the five the states that promote the seafloor requirements in the polar region.

The UN's Continental Commission is unable to conclude who has the right to the different parts of the polar basin, therefore, the countries must make agreement through negotiations. The negotiations collapse, and especially the great powers of X and Y are conflicting the continental shelf. Both states see their geopolitical position threatened if the other state is progressing with its continental requirements.

State X also believes that Norway's claims are disproportionate and that Norway is doing differential treatment in favor of itself even and some other nations. State X is therefore increasing the military presence in the Arctic. Due of increasing uncertainty about the security policy guarantees that underpin the Norwegian security policy, state X does not consider the cost in an attack against Norway as too high.

Based on the security situation, the Norwegian authorities, in cooperation with the Food Resources Council, implement current restocking plans. The authorities also provide advice to households to establish their own stores of food. Since state Y allows exploration activity in the disputed the areas, state X choose to use military force for to protect the country's interests in the Arctic, also aiming to exploit the initiative of an attack to push forward licenses from Norwegian authorities.

To secure support points for the warfare and to strengthen the defense of its own military bases and important infrastructure, state X invades Finnmark, Troms and northern parts of Nordland. Foreign forces are deployed in several areas and cities. Warships from state X patrol along the coast of northern Norway and combat aircrafts controls the air domain in the same area.

The war crimes destroys important transport infrastructure, as main roads and ports. In order not to be involved into the war, Finland and Sweden chooses to limit transport through the countries from central Norway and northbound. Electronic communication networks and services are also affected. The are acts of war and strong disturbances in transport and the like in a zone south of the occupied area.

NATO chooses to come to Norway to the rescue and The strengthening of allied troops begins. To delay strength building, state X bombes Mongstad and Slagentangen oil refineries and Regional landfills of fuel, including in Oslo, which leads to a fuel shortage. Based on strength building and diplomaticism activity, state X chooses to withdraw the forces from Norway after 180 days.

Appendix B - Common Definitions of Risk

Terje Aven, «Risk, suprises and Black Swans» (2014) presents a summary of risk definitions. The summary is far by complete, as there are a wide range of scientific perspectives. In this appendix, Aven´s summary is rendered in its entirety (Aven 2014):

1. Risk = Expected Value (loss) (R = E)

a. The risk of losing any sum is the reverse of expectation, and the true measure of it is the product of the sum adventured multiplied by the probability of the loss (De Moivre 1711).
b. Risk equals the expected loss (Verma and Verter 2007, Willis 2007).
c. Risk equals the product of the probability and utility of some future event (Adams 1995).
d. Risk equals the expected disutility (Campbell 2005).

2. Risk = Probability of an (undesirable) event (R = P)

a. Risk is the chance of damage or loss (Haynes 1895).
b. Risk equals the probability of an undesirable event (Campbell 2005).
c. Risk means the likelihood of a specific effect originating from a certain hazard occurring within a specified period or in specified circumstances (Kirchsteiger 2002).

3. Risk = Objective Uncertainty (R = OU)

a. Risk is the objective correlative of the subjective uncertainty; with uncertainty considered as embodiedin the course of events in the external world (Willett 1901)
b. Risk is measure uncertainty, i.e. uncertainty where the distribution of the outcome in a group of instances is known (either through calculation a priori or from statistics of past experience (Knight 1921).

4. Risk = Uncertainty (R = U) (Angell 1959, Mowbray and Blanchard 1961)

a. In regard to cost, loss or damage (Hardy 1923).
b. About a loss (Mehr and Cammack 1953).
c. About the happening of an unfavourable congingency (Magee 1961).
d. Of outcome, of actions and events (Cabinet Office 2002).

5. Risk = Potential/Possibility of a loss (R = PO)

a. Risk is the possibility of an unfortunate occurrence (Riegel and Miller 1966).
b. Risk is the possibility of an unfavourable deviation from expectations (Atheam 1969).
c. Risk is the potential for the realisation of unwanted, negative consequences of an event (Rowe 1977).

6. Risk = Probability and scenarios/consequences/severity of consequences (R = P,C)

a. Risk is the combination of hazards measured by probability; a state of the world rather than a state of mind (Pfeffer 1956).
b. Risk is a measure of the probability and severity of adverse effects (Lowrance 1976).
c. Risk is equal to the triplet (si, pi, ci) where si is the *i*th scenario, pi is the probability of that scenario, and ci is the consequence of the *i*th scenario, i=1,2, …N;i.e., risk captures: What can happen, How likely is that to happen? If it does happen, what are the consequences? (Kaplan and Garrick 1981).

d. Risk is the combination of probability and extent of consequences (Ale 2002).

7. Risk = Event or Consequence (R = C)

a. Risk is a situation or event where something of human value (including human themselves) is at stake andwhere the outcome is uncertain (Rosa 1998, 2003).
b. Risk is an uncertain consequence of an event or an activity with respect to something that humans value (IRGC 2005).

8. Risk = Consequences/damage/severity of these + uncertainty (R = (C,U))

a. Risk = uncertainty + damage (Kaplan and Garrick 1981).
b. Risk is equal to the two-dimensional combination of events/consequences (of an activity) and associated uncertainties (Aven 2007, Aven 2010).
c. Risk is uncertainty about and severity of the consequences (or outcomes) of an activity with respect to something that humans value (Aven and Renn 2009).
d. Risk is the deviations from a reference level (ideal states, planned values, expected values, objectives) and associated uncertainties (Aven and Aven 2011).

9. Risk is the effect of uncertainty on objectives (ISO 2009a, b) (R = ISO)

Appendix C - The Questionnaire

To: **xxx**

Dear Sir/Madam. I am a master student in risk and security management at the University of Stavanger in Norway, and now I hold the final master thesis.

Risk management is an overall process that in general consists of planning, risk analysis and risk assessment. This includes identifying threats and unwanted events, analyzing and assessing risks, and identifying measures that can reduce the risk or the consequences of an incident or unwanted action. This thesis will explore:

1) Risk perception in some organizations responsible for strategic and operative jurisdiction, naval cooperation and maritime preparedness in the High North (the Arctic).

2) If knowledge about differences or similarities between how the organizations perceive and communicate risk is a prerequisite for successful internal and cross-institutional risk communication in naval co-operation and maritime preparedness.

I would like to ask you the following three - 3 - questions:

1. How do you define risk?
2. Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?
3. Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

Please find on page 2: Guidelines for answers to the questions.

The answers will be associated with the named organization in the thesis, but all person names will be anonymized. It is optional to answer the questions and a rejection need no justification, even if this is desirable.

I look forward to receiving your reply to richard_utne@yahoo.no or to my residential address as soon as possible.

Kind regards,
Richard Utne,
Master student, risk and security management
University of Stavanger, Norway

Guidelines for answers to the questions:

Example of how you define risk: Do you have a clear definition of risk, is it expressed in a mathematic formula or or is it eg. considered as a contextual or dynamic concept?

Example of a definition: Preparedness: *the state of being prepared; Preparedness.*

Example of a procedure or guideline: A fire safety handbook

Example of risk communication: From a risk manager's perspective, the purpose of risk communication is to help residents of affected communities understand the processes of risk assessment and management, to form scientifically valid perceptions of the likely hazards, and to participate in making decisions about how risk should be managed. Risk communication tools are written, verbal, or visual statements containing information about risk.

Appendix D - Questionnaire responses

This appendix presents the questionnaires with fulltext answers from the representative organizations.

The Ministry of Justice and Public Security

Questionnaire:

1) How do you define risk?

See Report. St. 10 (2016-2017) «Risk In a Safe Society». There is defined risk and there is an entire chapter on risk.

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

This will be very difficult to answer for a ministry. We are responsible for a wide range of responsibilities and it will vary from site to area. If you consider the department's own-risk management (for buildings, employees, etc.), risk and vulnerability analyzes are made. A risk analysis for the sector has also been developed. Both except publicity. See the requirements of the ministries' work in kgl Res. By 15.06.2012 Instructions for the ministry's work on social security and preparedness, the Coordination role of the Ministry of Justice and the Preparedness, Supervision and Central Crisis Management.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

Again very difficult. But the report on the issue I refer to is an important document in which risk is communicated and, not least, tries to communicate some difficult dilemmas in relation to risk. Report. St. 10 (2016-2017) «Risk In a Safe Society» presents the Government's policy on public security efforts and constitutes the Government's public security strategy in a four-year perspective.

The Police Directorate

Questionnaire

1) How do you define risk?

The police directorate has not prepared an explicit definition of the term risk. Risks are assessed and estimated in a number of areas in the police, eg. Linked to HSE, within the field of prevention, at an elevated threat, etc. Furthermore, assessment of risk is an important part of planning, implementation and follow-up of police operations.

This implies that the definitions of risk may be context sensitive. The most common is to estimate risk as a result of probability and consequence. Associated to the definitions is that it is about something that can happen in the future and that there is uncertainty about what can be the outcome and whether the outcome will occur. We also refer to Stortingsmelding nr. 10 (2016-2017) «Risk in a safe society».

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

Examples:

- The HSE Handbook in the police, which describes inter alia, statutory processes and measures in the area of HSE. Police Emergency Response System (here is no risk defined) describes guidelines for police preparedness work.

- Action cards for use in acute and / or time-critical events to ensure that assessments and activities are performed.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

- After the terrorist incident in Stockholm, the Deputy Director communicated some of our assessments and some measures taken - https://tv.nrk.no/serie/dagsrevyen/NNFA19040717/07-04-2017#t=16m23s

- In connection with the implementation of May 17th. Ex: "The police are planning their readiness in good time before the National Day, and will implement the resources necessary for people to be safe when they celebrate national day," writes Department Director Kristin Kvigne in the Police Directorate in an email to NRK https://www.nrk.no/norge/vurderer-ekstra-sikkerhetstiltak-pa-17.-mai-1.13469328#fact-1-13470055

- When implementing emergency preparedness measures, such as weapons.

Salten Police District

Questionnaire

1) How do you define risk?

I would define risk widely as probability X consequence. What is the probability for an unwanted situation to occur, and if it does – what will be the consequences. However, for the Police, everything out of the ordinary will be viewed as a potential risk. Risk management is the basis for police activity.

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

Risk management is one of the most important focus areas for Norwegian police. To analyze risk, we make a risk matrix for each area to reduce both probability and consequence. For the Police, every area that we cover will be analyzed in this manner. The police either make these ourselves, or other authorities that we cooperate with make them.

One example could be Statens Vegvesen (State Highway authority). To reduce probability of being killed in traffic, we have crash barriers, speed limits, physical separation between driving lanes on busy roads, traffic controls etc. To reduce the consequences of a crash, you have seatbelts, car seats for children, safety-zones on cars, airbags etc.

Based on these matrices we develop contingency plans for each area of risk. We have designated people who work especially with risk management, crisis management and emergency management.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

The police use several canals to reach the public if there are events or crisis situations. We can use Twitter to inform and warn residents in specific areas if there is a fire, problems in traffic etc. etc. We also inform through media, campaigning etc.

The Governor of Svalbard

Questionnaire

1) How do you define risk?

The Governor of Svalbard has not defined risk as a concept. We see this as a weakness, and that we should include this in future plans and working documents to ensure a common situation understanding with cooperating partners. Initially, we see a need to conceptual risk in the Preparedness Council.

A common conceptual understanding in the Preparedness Council will, in from organization within the emergency preparedness work in Svalbard, to a large extent spread to cooperative and partners.

In general, I have the impression that the term risk in the organization and with partners is becoming utilized from risk = probability X consequence.

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

At present, acute unwanted incidents has been largely handled by the police department at the Governor of Svalbard (with the Governor as the of the Chief of Police). The police relate to PBS1 (Police Emergency Response System), as well as to PBS 3 (Police Local Plans). PBSweb is a computer system where all plans within different categories are gathered, as police crews have access to.

There are some, but not much, risk management plans available to all employees. We have employd a civilian person responsible for preparedness as a work area to improve this work.

In addition to the work the police handles, several employees of the Governor have work tasks involving risk assessments, such as oil spill, area planning, and handling of animals, which entails planning within these areas.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

In addition to being strategic, the Emergency Council on Svalbard is far more operational than the corresponding body is on the mainland. Due to the few people with many responsibilities, the Emergency Council is involved in identifying risk areas as well as handling specific events.

One example is that the Emergency Council was strongly involved in the preparation of Svalbard ROS, which corresponds to the county governor's ROS on the mainland. Risk areas were identified jointly. The same people are often involved in developing plans in their own organizations as well as they are involved in handling the specific unwanted events. The Emergency Council has regular meetings approx. 4 times a year. During the meetings, both current events and topics will be addressed, and strategic assessments will be made for future challenges.

In addition, the Emergency Council, or part of it, is called for concrete handling of expected or ongoing events. This ensures good communication within the emergency response area. There is a low threshold from the Governor to call the council if there is a possibility that unwanted incidents may occur. An example is an alert for weather or landslides. Police officers are often used in contact with relevant persons / organizations to ensure communication with suspicion of possible danger of unwanted incidents.

In addition, in everyday life there is continuous contact and a lot of cooperation across the organizations.

I would like to say that cooperation in this area is very good at Svalbard. High attendance rates, a small community of highly competent people who have good knowledge of each other's work areas ensure good communication. The weakness is that most people have "more hats on", high turnover in positions posing challenges in connection with experience transfer, as well as ensuring notoriety.

Joint Rescue Coordination Centre (JRCC) Bodø

Questionnaire

1) How do you define risk?

The JRCC has 3 different tasks. All are related to the functions and roles of the rescue service and the continued social security concept. The priority task is search and rescue. In addition, we coordinate a number of air ambulance events with or for the health service. In addition, we will provide transportation assistance to the police.

The last two tasks are characterized by routine, so as to understand that it is not linked to any risk assessment by HRS, but where we provide help to health, the police that have identified a need for help (risk assessment). The primary mission of the rescue service at JRCC is stated in kgl res of 02.11.2015

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

The task that JRCC carries out is linked to our responsibility to provide assistance in different situations. As of today, HRS has defined a number of events that fall under our responsibility. These Defined Unwanted Events (DFU) are defined types of events that all largely define who JRCC is to collaborate with, what responsibilities are being distributed and what roles the different agencies, resources will have.

DFU´s are again linked to International Planning, the IAMSAR and the Solas Convention, which states how search and rescue organizations are to be organized and what responsibilities they have. It also means that the responsibility is operationalized through a number of agreements with neighboring countries that also indicate the allocation of responsibilities.

JRCC in Norway is therefore given the highest operational responsibility for all types of rescue operations. On land, responsibility is shared with the police through LRS in the various police districts, plans and roles are distributed in the various cases. For air traffic events where airplanes are involved, JRCC will work closely with the Air Traffic Service / AVINOR and define tasks until an aircraft is secured or an emergency on land or in sea is defined. Events on the sea, defined as rescue service (danger of life) are given in full to HRS responsibility to coordinate. That means that it is JRCC that organizes, summones resources and clarifies the situation.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

JRCC´s task also means that there is close dialogue with all the society's resources and organizations that can play a part in a rescue operation. In particular, this applies to health, police, volunteers, government agencies (the Armed Forces, DSB and others), all of which are important resource providers to the rescue service. The Norwegian rescue model is

thus operationalized as a collaboration between public, voluntary and private in a common deed to save lives.

JRCC coordinates a rescue operation by getting all resources to communicate together, using different channels for common situational understanding. The tasks are related to alerting potential resources, determining tasks and procedures, conducting a rescue operation with responsibility allocation, taking care of emergency situations and ending when there is no longer a risk of life.

The JRCC´s do not have direct responsibility for storing materials or safeguarding environmental safety. Through a rescue operation, JRCC will notify the authorities in accordance with the applicable procedures. The crisis support unit will receive information on an ongoing basis if an event may lead to further involvement of the national apparatus for crisis management (municipality, county, coordination channels).

The Norwegian Coastal Administration

Questionnaire

1) How do you define risk?

As shown in the appendix, we have a policy that describes the Coastal Administration's overall approach to risk, which distinguishes from:

1. Overall risk management in relation to achievement and resource utilization. More about the methodology can be found at https://dfo.no/fagomrader/risikostyring/

2. Operational risk management in relation to the Norwegian Coastal Service's service production. A separate procedure based on NS-ISO 31000 has been prepared.

Otherwise, the Coastal Administration has tasks related to port security, in which NS 5832: 2014 «Social Security - Protection against Intended Activities» is based on Norway's international obligations for securing international shipping. More info http://www.kystverket.no/Maritim-infrastruktur/Havnesikring/Veiledning-/

NCA conducts Environmental Risk and Oil Spill Response Analysis. We usually do that with a three steps approach:

a. *Probability analysis for spills from shipping industry*
b. *Environmental risk assessment for consequences*
c. *Scenario based preparedness and response analysis*

(we use the ordinary definition Risk= probability x consequences), no mathematic formula.

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

We do not have written procedures or guidelines for this. Our goal is to have the risk assessments as living documents - when i.e. probability changes may be because of increased traffic – analysis must be adjusted

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

Risk communication is challenging. For us that means in particular having spoken dialogue/meetings/seminars with the communities via their intermunicipal preparedness regions.

The Norwegian Oceanic Region Vessel Traffic Service NOR VTS

Questionnaire

1) How do you define risk?

The Coastal Administration has defined the risk of size and type of cargo. Either together, or separately. All ships over the BT 5000 are denoted manually or by the system as a risk vessel. In addition, type of load. That is, ships under the BT 5000 can be risk ships on the basis of their load.

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

Risks are described in regulations, procedures, instructions and checklists. As an example, all ships above 150 meters and ships with hazardous and / or polluting cargo must obtain permission to enter the VTS area at Melkøya. Permission is given on the basis of checklist containing: weather, wind, visibility, los, etc.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

Risks are not directly communicated to ships. But in most cases this is obvious. Example full loading thoughts. The captain then understands that he is carrying a ship that poses a high risk. And comply with the regulations introduced to prevent major accidents.

The Port of Mo i Rana (NOMQN)

Questionnaire

1) How do you define risk?

Risk is the danger of something undesirable with subsequent negative consequences.

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

We have our overall ROS plans together with Rana Municipality, this type of risk that is associated with negative consequences for life and health. We also provide emergency contingency plans for acute pollution as a cluster member of IUA Rana. As we are ISO 9001 and 14001 certified, we have what covers financial risk and personal risk.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

We inform governmental organizations as needed; fire, municipality, police, coastal power station. These organizations will direct this communication to any third party.

We use social media on minor issues such as ice in the fjord and other information agencies and communicate directly with ships.

The Norwegian Ministry of Defence

Questionnaire

1) How do you define risk?

Risks are about potential deviations from the expected or potential deviation from our goals. With that reference point, risk is formally defined as a combination of possible consequences (outcome or result) and associated uncertainty.

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

The Ministry of Defense has established its own internal control system that will help the Ministry to have adequate systems and procedures for insight into operational ability in the defense sector. This system will help to identify risks in this area and that consequences and uncertainties are thus considered as part of the overall management of the sector.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

The information about risks associated with operational ability is included with other management information such as financial risks, changes in security policy situation, etc. in the basis of the management of the sector.

The Norwegian NDUC

Questionnaire

Note 29.09.2017

Concise on the Risk Concepts and Expressions of FHS / FSTS

FHS / FSTS / LOS / MilPed & Method

The note is a response to three core questions (provided by Richard Utne as an information base for his master's thesis at UiStavanger): 1. How do you define risk ?, 2. Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility ?, 3. Do you have examples? The assignment is given to the research group via FSTS, who first received the request. The answers are given in an overall description. The information (note + attachment) has been obtained after discussion and information gathering in the research group DU (The unforeseen) at the Defense Staff School, some searches in FOBID (Defense Library / Archives System for Central Public Documents / Management Documents) and through the DU Group's daily knowledge of organization / documents.

There have been no research-based studies / collection. Consequently, the term "risk" may be represented in both internal documents and official management documents and other uses not identified or reported through this simplified review and search procedures, and graded documents are not included.

The memorandum shows a sample of and examples of how the risk concept is treated, defined and communicated primarily by the Armed Forces staff school, within the core areas of education, research and doctrine development. There will also be a continuum with regard to the authority of "management documents" (ie, referenced NATO documents). We refer the "Staff Handbook" for the Armed Forces Document Hierarchy / Authority, in relation to the term "Management Documents" (p. 30), which can be downloaded here: https://brage.bibsys.com/xmlui/handle/11250/2405039

1. There are not identified officially specifically developed definitions / use of the risk term, only applicable to the Defense College / Defense Staff School. In our core business, teaching, research and doctrine development, the risk term is used primarily as expressed in official defense / sector management documents, from civil and general sources (eg textbooks or ISO), or context-specific descriptions / definitions of the term in connection with teaching / projects / research / doctrines (as the individual develops and adjusts for his / her use).

2. Here are some examples of how the risk term is expressed in different documents, situations and contexts, which are also used in different contexts at school.

3. In operational contexts, the Armed Forces use largely NATO definitions as the basis for their use and understanding of the "Risk" concept, and then to describe risks associated with the planning, implementation and evaluation of military operations. For example, the main concept "Operational Risk", expressed in two dimensions (NATO, Allied Command Operations Comprehensive Operations Planning Directive, COPD Interim V2.0, Mons: Supreme Headquarters Allied Poweer Europe, Belgium, 2013a), 4-49) is used:

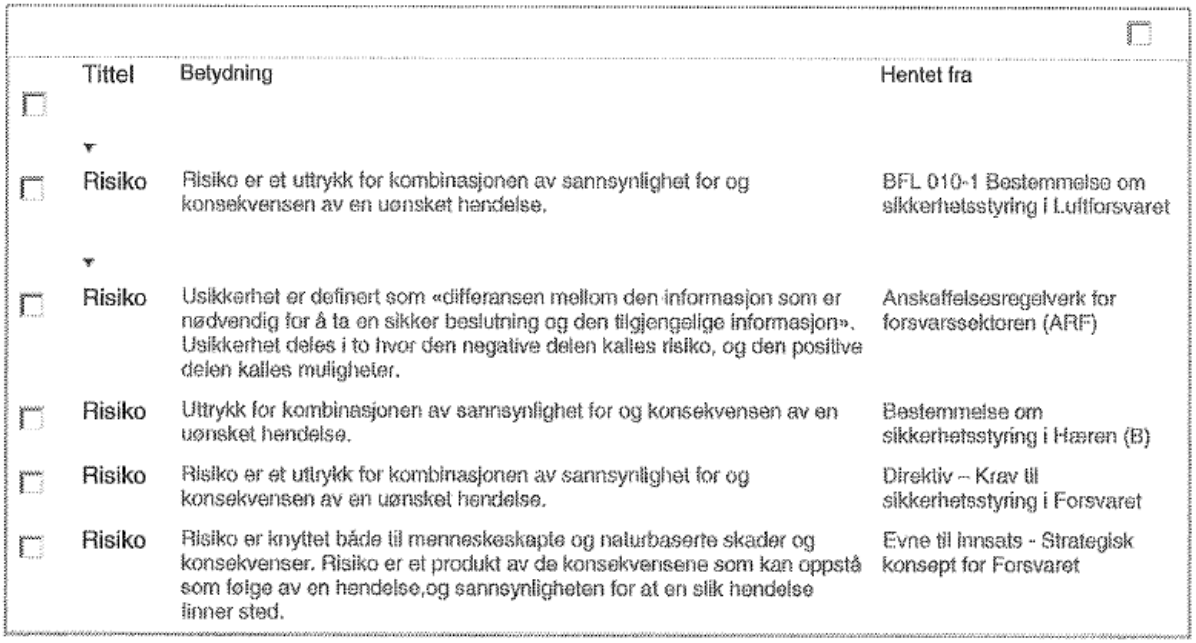
   1) Risk to Mission = Risk associated with achieving operational goals (ie, uncertainty about whether or not goals can be achieved).

   2) Risk to Force = Risk of own forces as a result of conditions in the operating environment (where there is military activity) and other players' capabilities and actions in the operation area.

   This rests on an underlying understanding that military operations can pose a risk of loss of own strengths, materials and values. This is because the military forces are merely a means of achieving politically determined goals and power while at the same time being subject to both ethical and legal laws and policies applicable to the use of military power.

4. The risk concept is also linked to various aspects of the use of military force and methods of warfare. Central term is the Center of Gravity (CoG). This term is found in various Norwegian doctrines (for the different weapons and common - Armed Forces Joint Operations Doktrine, 2014 (more fully covered in earlier versions), and is thus incorporated into operational guidance documents for the Armed Forces (see also the Staff Manual, attached p. 30 for the division of the document hierarchy / authority, the staff manual applies the risk concept also in several contexts, see attached document.) The CoG concept covers the relationship between own vulnerability and strength, ie the risk of changing the center of gravity during an operation. Such a risk assessment implies the probability assessment of defeat / victory (achievement of politically assigned missions / goals) in the short or long term. Such ratings are also referred to as risk identification (ibid.). However, the term "risk" alone is not defined in these documents.

5. Overview of some key official documents where the "Risk" concept is used with given specific definition / explanation (documents can be obtained on request):



Tittel	Betydning	Hentet fra
Risiko	Risiko er et uttrykk for kombinasjonen av sannsynlighet for og konsekvensen av en uønsket hendelse.	BFL 010-1 Bestemmelse om sikkerhetsstyring i Luftforsvaret
Risiko	Usikkerhet er definert som «differansen mellom den informasjon som er nødvendig for å ta en sikker beslutning og den tilgjengelige informasjon». Usikkerhet deles i to hvor den negative delen kalles risiko, og den positive delen kalles muligheter.	Anskaffelsesregelverk for forsvarssektoren (ARF)
Risiko	Uttrykk for kombinasjonen av sannsynlighet for og konsekvensen av en uønsket hendelse.	Bestemmelse om sikkerhetsstyring i Hæren (B)
Risiko	Risiko er et uttrykk for kombinasjonen av sannsynlighet for og konsekvensen av en uønsket hendelse.	Direktiv – Krav til sikkerhetsstyring i Forsvaret
Risiko	Risiko er knyttet både til menneskeskapte og naturbaserte skader og konsekvenser. Risiko er et produkt av de konsekvensene som kan oppstå som følge av en hendelse,og sannsynligheten for at en slik hendelse finner sted.	Evne til innsats - Strategisk konsept for Forsvaret

6. Risk in the meaning of "Safety Management" in the Air Force Security Management (BF-L 010-1 (2017)), where a number of nearby expressions are also defined and exemplified (document attached).

7. The following is used in the Armed Forces' pedagogical viewpoints (2006) (developed by FHS / FSTS), which is a training document in education, applicable to the entire Armed Forces: "... For training and exercises, risk and safety must be thoroughly and thoroughly assessed in all didactic phases." p. 23).

8. "Risk" is only mentioned once in Meld. St. 14 (Competency for a new era). This document sets out the basis for competence management in the Defense sector (applicable to all agencies). The "Risk" concept is not included as part of the document's main text, but appears in a fact box about the response defense, and is expressed in the light of the risk of others in terms of attacks: "Modern capabilities and high responsiveness will give the one who challenges Norwegian security and independence high risk and costs. "(p. 14).

9. The risk concept is used throughout the DIVØ (Directive for Business and Financial Management in the Armed Forces), but does not contain definitions, and uses the risk concept in the light of traditional (civil) business management, also referred to as the main features of the Staff Manual, attached).

10. As an example of the risk concept defined in research / research reports by FHS / FSTS and projects (which defines itself or uses source-based definitions), a descriptive definition of "risk" in the light of the "unforeseen" that we currently use in the research project "Det Unforeseen and Collaboration under Risk» (prospectus, Torgersen, 2017, based on Pedagogy for the unforeseen (Fagbokforlaget, 2015):

"Risk" means that an event is being developed under unpredictable conditions. As a consequence, the outcome may be undesirable or negative, with potentially dangerous loss of life, values or otherwise defined as valuable, essential and important, generally or in a given context. However, an uncertain outcome can also incorporate positive and desired consequences, for example in relation to learning processes in a training context, and which are not planned in advance."

The Norwegian Joint Head Quarters

Questionnaire

1) How do you define risk?

There are many definitions of risk. A common understanding among security personell is given under.
Security Risk - the likelihood of an operations inherent vulnerability being exploited by the threats, leading to the operations being compromised or missing the wanted impact on the enemy or the wanted result.

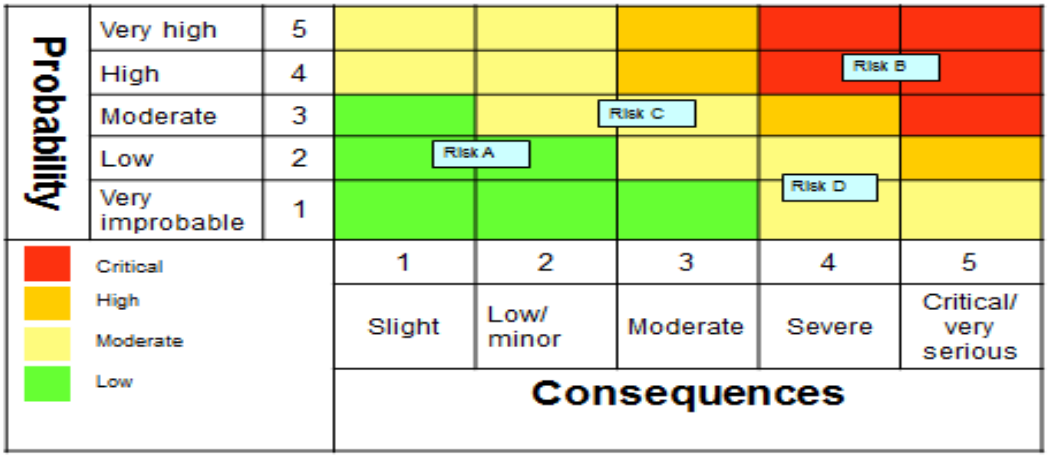
Security Risk Management - the process of identifying, controlling and minimizing events that may give an undesirable effect on operations.

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

The major resources required for security risk assessment are time, skilled manpower, and, preferably, an automated security risk assessment tool using a sound methodology. For this reason, the first security risk assessment for an operation will be the most resource intensive. Subsequent updates to a security risk assessment can be based on previous baselines of information, with a possible decrease in the time and resources required. The Joint Staff of the headquarters take part in the process. Operational security is however led by J 3 and the process managed by a core team which are responsible to carry out this task in every operation and also during the entire and long term planning process.

Security risk management involves planning, organizing, directing and controlling resources to ensure that the risk remains within acceptable bounds, at optimal cost. It is also a collaborative process where representatives of various interest groups develop a shared understanding of requirements and options. Increased awareness will strengthen security and make it more compatible with user needs. Several tools have been developed for risk assessment and are used in the planning process and throughout the planning process. One example of a risk assessment tool is the following;

Risk matrix.



Consequences

- Determine the **consequences** of the various hazards:
  - Slight – in general, absence of consequence.
  - Low/minor – slight consequence.
  - Moderate – may result in minor injury, minor sickness, minor damage to materiel.
  - Severe – may result in serious injury, sickness, damage to materiel, etc. 'Severe injury' is defined as: any injury, physical or mental, which leads to a permanent or long term inability to work.
  - Critical/very serious – may result in death or **serious injury**, loss of vital materiel.

Probability

- Determine the **probability** of the various hazards occurring:
  - Very improbable – very unlikely or unlikely to occur.
  - Low probability – incident will seldom occur.
  - Moderate probability – reason to expect that the hazard will occur at some point in time.
  - High Probability – likely to happen/occur.
  - Very high probability– will occur immediately or in the course of a short period of time.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

The outcome of the Risk Management process will be the coordinated inputs from the Joint Staff with respect to the different Domains.

The NJHQ risk assessment will in reality be the various reports, assessments, Commanders Update, Joint Co-ordination Board and other meetings and briefings in the HQ as required.
Reports and other products will be put into the Operational Orders and Plans as required and deemed necessary.

The Risk assessment process is an on-going process and will be continued throughout the duration of the operation. All operational plans have Annexes an Appendices describing the risks. These orders are distributed to all subordinated units and the understanding of the orders are verified throughout the chain of command. In addition to this, it is communication, on a lower level between officers dealing with risk assessment and management.

The Norwegian Coast Guard

Questionnaire

1) How do you define risk?

The Coast Guard is in a special position in several areas, including within different types of risk assessment. This I say on the basis that the Coast Guard's work consists essentially of exercising authority on behalf of others. For the same reason, it will be the primary business that defines the risk within its professional field of work. In this context, the Coast Guard is a tool for use by other state-owned entities with primary responsibility to reduce the risk within its specific area of responsibility.

For example, the Customs Union will have its risk image and a need to reduce the risk of eg smuggling. In this context, the Coast Guard is a risk-reducing measure in the Customs Target's aim to reduce the risk of smuggling. Similarly, risks associated with other governmental areas under the responsibility of other agencies than the Coast Guard may be said, but where the Coast Guard helps to reduce the risk.

The Coast Guard, of course, assesses its own risk regardless of who has primary responsibility. But this is primarily related to safety (Safety). This is safeguarded in its own safety management system, handled and administered by the Navy. If you are looking for a more general and fundamental feedback regarding the Coast Guard's safety management system, please contact the Security Manager at the Coast Guard.

However, I have tried to provide a good picture of how the Coast Guard assesses the risk of primary responsibility: "Fisheries Control at sea", focusing on risk in fisheries and what is needed to reduce the risk in fisheries. In this context, there is an objective to increase the likelihood of sustainable management of renewable resources in the ocean. And given a certain number of fishing vessels in fishing, and given challenges in this fishery (small fish, illegal species, draft, etc.) how many Coast Guard vessels need to reduce the risk of management at some point in a particular zone in a particular fishing, Is inadequate.

The risk in a given ongoing fishery is based on two primary input values:

A) *Number of active fishing vessels in a specific zone (Value 0,1,2,3 where 3 is highest)*
   Here, depending on the zone, the value (0,1,2,3) is defined differently based on the size of the area, and the density.
   Ex: 50 vessels fishing in Skagerak will have a value other than 50 vessels fishing in the Fisheries Zone.

B) *Extent and severity of the challenges associated with a given fishery (Value 0,1,2,3 where 3 are major challenges). These are assessments based on inspections in an area over time, known yearly variations etc. Ex: If in a specific zone a large amount of fish below the minimum size is likely, or there is a high probability of interfering with species that are not allowed to catch, the value will be high (3). Due to the fact that challenges in the ongoing fishery are more important for the risk assessment than the number of vessels fishing, the B-value is doubled.*

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

The Coast Guard is primarily responsible for the fisheries control at sea (while the responsibility for control on delivery to fish reception facilities on land is shared between the Directorate of Fisheries and the Sales teams). Risk assessment of the catches in total is therefore based on an overall risk assessment prepared by the Directorate of Fisheries, the Coast Guard and the Sales Teams, in joint effort. This is called "National Strategic Risk Assessment in Fisheries Control" (NSRV), published annually and is based on «Letter of implementation» (IVB) issued by the Ministry of «Nærings og Fiskeridepartementet». NSRV lists risks associated with different fish stocks and / or risk of offenses within given fisheries.

This is then operationalized by the Coast Guard, which prepares «Coast Guard Operational Risk Assessment» (annualy). This is sent to Coast Guard vessels and is limited to the responsibility The Coast Guard is given in resource control. Based on this, «Coast Guard Weekly Operational Risk Assessment» is prepared. In addition, daily risk assessment «SA- in resource control» is prepared (see Figure 1).

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

«Communication of risk» within fisheries occurs on several levels, depending on severity and extent. If the Coast Guard in an area reveals a high risk of interfering with fish under minimum size or interference with fish it is not allowed to catch, this will be communicated to other fishing vessels that are required to take measures to reduce the risk of ilegal fishing.

The results of the inspections are reported to the right authorities (Coast Guard Headquarter), and are important entry values when daily and weekly risk assessments are to be made.

The risk in the fisheries, revealed through continuous presence and inspections carried out by the Coast Guard, can reveal major and more fundamental challenges in the fisheries which, in turn, could give long-term risk (eg: dimming of a specific fish stock). This must be implemented in «National Strategic Risk Assessment in Fisheries Control», so that the risk of degradation is reduced or eliminated.

NATO Shipping Centre

Questionnaire

1) How do you define risk?

As for a military organisation my perception and difing of risk is clearly two-fold;
One part is related to the management of the organisation as to where there is a administrative ***risk*** *mishaps and accidents and thus a possibility for personnell to be accidentally hurt (also mentally) or killed, or material to be damaged. This puts the organisation at a managerial risk for not being able to fulfill its taks in an efficient manner.*

The other part is where there is a operational risk or ***threat*** *to the organisation and its capabilities from a dedicated opponent or enemy. This endangers the organisations ability to fulfill its reason for being by failing to destroy or nutralise an aggressor, thus threatening the organisations ability to defend or protect its objectives (territory or interests). This may put a nation or an alliance at risk for being overtaken or for being subject to the will of an aggressor.*

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

Administrative risk is mitigated through substantial regulations and procedures that have been operationalised primarily based on experience, or exchange of experience from similar organisations. This materialises in procedures and described methods on how to mitigate risks and how to reduce risk for making the wrong, or not optimal, decisions in static dilemmas (choises). These descriptive operationalisations of risk issues cover everything from how to avoid damage to personell or material during administrative/practical tasks, on to how to make the optimal choise of what fighter aircraft to choose/procure. The overall point being reducing the risk of making the wrong, or less optimal, decision in management.

For dynamic problems and risks they are operationalised through an Operational Planning Process (OPP) where an opponents most likely and most dangerous courses of action (CoA) are operationalised and held up against own capabilities and envisaged CoA's. The resulting choise of own CoA will be further developed into a dynamic plan aimed at maximising the possibility of own success and minimising the enemy's. In this process it may also be argued that it is not the final plan itself, but the process leading to it, that operationalises the threat the enemy poses and thus enables own organisations ability to counter him. This then mitigates the risk of him succeeding.

3) Do you have examples on how risk is communicated in your jurisdictional area of responsibility?

Yes; Action Stations.

NCAGS Norway

Questionnaire

1) How do you define risk?

The term RISK is not specifically defined in NATO doctrines. RISK and THREAT are frequently used as synonyms and closely linked to VULNERABILITY. As can be seen in the attached DRAFT Tactics, Techniques and Procedure (TTP) Vulnerability Assessment & Risk Management para 8.d, it is implied that RISK is a function of PROBABILITY and IMPACT/CONSEQUENCE.

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

In my opinion, NATO, National armed forces and other safety and security mechanisms have always been conducting risk management in a very structured way through specialized institutions/ organisations to detect and counter any conceivable Threat/Risk to Safety and Security. Common procedures for Planning, Execution and Evaluation of operations and exercises, development of Standing Operating Procedures (SOPs), networks for command, control and coordination and exchange of information, repositories for Lessons Learned to improve TTPs etc. are all components of military/civilian risk management. The NATO Rules of Engagement (ROE) catalogue may serve as an example how risk is managed in NATO and nations on the political, strategic, tactical and individual levels.

However, as can be seen from the attached TTP, the term RISK MANAGEMENT has been imported without a proper, common definition, nor common structures/methods for operationalizing Risk Management. In NCAGS policy and doctrines, Vulnerability Assessment and Risk Management is closely linked. As a mechanism for promoting civilian - military cooperation in the maritime domain, we are not conducting Risk Assessment for commercial shipping as dictated through the ISM- and ISPS-Code. NCAGS role is to inform authorities, ship owners and masters of risks to maritime security for their Risk Assessment for each individual vessel and voyage.

Risk Management related own mission/NCAGS task is included in the planning process by defining Measures of Performance (MOPs) and Measures of Effectiveness (MOEs). Periodic Mission Reviews (PMR) are performed as dictated by higher level HQ, and mitigating actions are implemented where progress is not in accordance to plan.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

In terms of NCAGS there are principally three ways of communicating risks to commercial shipping;

1. *NATO Shipping Centre webpage, www.shipping.nato.int. Information on maritime security risks validated and published globally to inform Owners' and Masters' risk assessment for each ship/voyage and specifically designed Maritime Security charts.*

2. *Specific advice, guidance and assistance to Owners and Masters for a specified geographical area iaw Tactics, Techniques and Procedures (TTPs) described in ATP-02.0 NCAGS Manual.*

3. *Through ATP-02.1 NCAGS Guide to Owners, Operators, Masters and Officers, Recommended Protective Measures against conventional and unconventional threats.*

Risks to the military commander's mission, including mitigating actions should be described in operational and tactical level planning processes.

The Norwegian Shipowners Association

Questionnaire

1) How do you define risk?

We use the logic from the three-factor model, where the risk is the product of assessing value, threat and vulnerability. So the definition of risk would be; the relationship between the threat against a value, and the vulnerability of the value from the specified threat.

2) Do you have examples, defined procedures or guidelines for how risk management is operationalized in your jurisdictional area of responsibility?

We seldom conduct operationalized risk management directly. Our role is to describe the threat environment and the adviced mitigation guidelines to counter these threats. The shipowners and companies conduct such assessments themselves.

3) Do you have examples of how risk is communicated in your jurisdictional area of responsibility?

We do not communicate risk as such. We describe the operational environment, where risks can be identified by the different actors, depending on their individual characteristics. This is done in a number of ways from issuing general reports and specific reports, telephone conversations, meetings and visits to members.