Is Norwegian long term defence planning risk based?

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English summary

The central and unavoidable challenge to defence planning is how to cope with uncertainty. As a strategic defence planner, the aim is to contribute to a long term defence plan which is a foundation for a viable national defence. Despite our best effort in forecasting, we can be caught by surprise. Limitations in our method represent a risk that may reduce the relevancy of the long term defence plan. Analyzing and taking actions on these potential risks by further developing the current defence analyses into a more robust method, may increase the likelihood of identifying this flexible force structure, a force structure which is better prepared for an uncertain future.

FFI´s long term defence planning method is based on a capability analysis that includes both scenario analysis and force structure analysis. The main objective of our method is to identify a flexible and realizable force structure that can handle the nationally defined level of ambition for the defence in a cost efficient manner, both in a short and long term perspective. In addition, the method should take into account external changes and influences, like changes in security challenges and budgets, in the development and state of allied cooperation and in the defined level of ambition. The identified force structure must be adaptable in response to the external changes.

Considering risk is currently not an explicit part of this method. Still, risk is taken into account throughout the several steps of our method and the purpose of this article is therefore primarily to evaluate the method with regard to uncertainties and their consequences, how and if these uncertainties are treated and how these uncertainties influence the robustness of our method.

The current report was written in connection with a conference that was held by SAS-093 "Risk based planning" in October 2011[1]. The report argues that increased risk awareness throughout the long term planning process is necessary to improve the robustness of our current method. Furthermore, the overall risk when identifying the optimal force structure will be reduced by giving more attention to uncertainties and potential risks in each step of a capability based long term defence planning method.

[1] SAS-093 is a technical team of scientists under the SAS-panel in NATO STO (Science and Technology Organisation)

Sammendrag

Å drive med langtidsplanlegging, generelt, og for Forsvaret spesielt, innebærer å si noe om hvilke evner Forsvaret bør ha om 10–20 år. Umulig vil noen kanskje mene. Det er i hvert fall en uunngåelig utfordring at langtidsplanlegging er forbundet med stor usikkerhet. For å håndtere dette er det derfor viktig å ha en metode som tar hensyn til ulike typer usikkerhet. Om metoden ikke tar hensyn til denne usikkerheten vil relevansen av en langtidsplan reduseres. Ved å kartlegge ulike begrensninger i metoden og så foreslå tiltak som kan bidra til å videreutvikle de nåværende forsvarsanalysene til mer robuste analyser, så vil sannsynligheten øke for at vi identifiserer en mest mulig fleksibel forsvarsstruktur. Vi har derfor ønsket internt å øke vår egen kompetanse på usikkerhetsanalyser, og å gjøre vurderinger av usikkerhet i vår egen langtidsplanleggingsmetode.

FFIs metode for langtidsplanlegging er basert på kapabilitetsanalyser som inkluderer både scenarioanalyser og strukturanalyser. Ved å bruke denne metoden ønsker man å identifisere en fleksibel og realiserbar styrkestruktur som kan håndtere det definerte ambisjonsnivået for Forsvaret på en kosteffektiv måte, både på kort og lang sikt. I tillegg bør metoden ta hensyn til eksterne forandringer som endringer i de sikkerhetspolitiske og økonomiske rammebetingelser i det allierte samarbeidet og i det definerte ambisjonsnivået. Den identifiserte styrkestrukturen må kunne tilpasses disse eksterne forandringer som kan skje i fremtiden. Å analysere usikkerhet og risiko er ikke en egen del av dagens metode. Indirekte tar man likevel hensyn til risiko i de ulike trinnene av metoden.

Hensikten med denne rapporten er primært å evaluere begrensinger i metoden, og hvilke konsekvenser dette kan ha for analysene, hvordan disse begrensningene eventuelt blir håndtert, og om denne usikkerheten påvirker robustheten til metoden. I denne rapporten hevder vi at økt risikoerkjennelse gjennom hele langtidsplanleggingsprosessen er nødvendig for å øke robustheten av vår nåværende metode. Videre vil den samlede risikoen når man identifiserer den optimale styrkestrukturen reduseres ved at man er mer oppmerksom på usikkerhet og mulige konsekvenser i hvert trinn av den kapabilitetsbasert metoden for langtidsplanlegging av Forsvaret. Denne rapporten ble skrevet i forbindelse med en konferanse som SAS-093 ”Risk based planning” arrangerte høsten 2011[2].

[2] SAS-093 er en studiegruppe under SAS-panelet i NATO STO (Science and Technology Organisation)

Contents

1 Introduction

How to cope with uncertainty is the central and unavoidable challenge to defence planning. It can be argued that to plan a defence structure with a 20- to 30-year perspective is an exercise in futility. It is, nevertheless, the task of political and military leaders to make investment decisions with impact over just such a time perspective based on the imperfect knowledge we have today. There will always be a degree of uncertainty associated with strategic planning, although defence planners tend to ignore uncertainty or to assume it away. According to de Spiegeleire and Bekkers there are reasons to believe that this type of uncertainty has actually increased [1]. Examples of this uncertainty are the termination of the cold war and the extent of the 9.11 terror attacks. Although we cannot make plans for every potential strategic shock, risk based planning will to a greater extent take these events into account, increase the robustness of the method, and give the basis for identifying a more flexible force structure.

The goal and objectives for FFI's long term defence planning method been defined in [2]. For our purpose, it is necessary to rewrite these objectives. The paramount goal, what we want to achieve by our method is to identify a defence structure that is both robust and flexible with regards to changes in the level of ambition, the economy and the security environment. The defined structure should also be the most cost efficient force structure with regards to the identified capability requirements.

Several methodical factors are important to finding the optimal military structure. Firstly, we need a method that can identify and concretise the security challenges that the nation may face in the future, in times of peace, crisis and war, within and outside our immediate environment. Secondly, the method should be capability based, i.e. seek to establish the required defence capabilities before explicit solutions in terms of platforms and units are specified. To meet these objectives FFI uses a multi-step method, which includes both a capability- and a scenario based method for long term defence planning.

In order to increase our awareness of strengths and weaknesses in our method, this study aims to identify the uncertainties in our method. Furthermore, we want to identify whether risk is or can be reduced or mitigated in the current method. Lastly, we aim to identify actions that can reduce shortcomings in the capability based planning process and contribute to more robust long term defence planning.

1.1 Defence analysis – Some challenges

There are several reasons for the many-faceted uncertainties that are related to defence analysis in Norway. In the first place, there is no single dimensioning national scenario. We have 16 national scenarios within six scenario classes. Amongst these, there are some scenarios, for instance terror attacks, in which the readiness is the dimensioning factor. In other scenarios, the readiness is not a critical factor, but the volume of the various capabilities would be dimensioning. Secondly, there is no single dimensioning international scenario, and hence our contributions to NATO-operations are determined through negotiations. Although the current international operation in

Afghanistan is one of the main challenges to the Norwegian Defence, its dimensioning role in terms of force structure is vague, unlike for our neighbouring country Denmark. The last and major challenge within defence analysis is the many-dimensional uncertainties in the long term. External uncertainties regarding the security challenges are both global and regional; there is uncertainty with regard to the future of the Alliance and other international bodies that should be accounted for. What is the cost of doing business, and how will future budgets look like? The current recession may influence our national defence. There are also internal uncertainties connected to our method. Does the method take into account all the important factors that may influence our defence in the long (and short) term?

To raise risk awareness, it is important to discuss which types of uncertainties the current method cover, to identify potential gaps, and to evaluate consequences of the identified and potential future uncertainties.

1.2 What is risk?

Intuitively, we understand that risk has something to do with an undesirable outcome. As there is no agreed definition of risk, the many inconsistent and ambiguous meanings attached to 'risk' lead to widespread confusion. Very different approaches to risk management are taken in different fields [3]. Generally, risk analysis makes it possible to do something to reduce or remove a threat. Most important is to avoid situations that are likely and has catastrophic consequences. There are still three more combinations of likelihood and consequences. Situations that are likely but has minor consequences, the unlikely situations with little or now consequences, and the unlikely situations with critical consequences, the so-called black swans.

Risk related to engineering can be calculated to a great extent. However, the risk related to long term defence planning has little or no empirical data, and hence risk in the current setting cannot be calculated. The risk assessment has to be based on qualitative evaluations. A simple definition of risk is the ISO 31000 (2009) which defines risk as the "effect of uncertainty on objectives" [4]. In this definition, uncertainties include events (which may or not happen) and uncertainties caused by a lack of information or ambiguity. According to Aven [5] this definition is too vague, and together with Renn (2010) he has divided the concept of risk into two categories [6]:

1. Risk is expressed by means of probabilities and expected values.
2. Risk is expressed through events/consequences and uncertainties.

For this study, only the latter way to express risk is suitable. The unwanted methodical consequence, or event, within defence planning, is to give bad or very wrong advice to the decision makers regarding future defence capability requirements.

Risk can be explained by its two main components [6]: i) the events and their consequences, and ii) uncertainty about these – will the events occur and what will the consequences be? Aven and Renn suggest the following definition of risk: "Risk refers to uncertainty about and severity of the consequences (or outcomes) of an activity with respect to something that humans value".

Traditionally, defence planners have tended to ignore uncertainty or to assume it away. The uncertainty within defence planning apparently has increased [7] and should therefore be assessed more directly than previously. In 2002, the former US Defence Secretary Donald Rumsfeld introduced the following two dimensions of uncertainty:

- "First-order uncertainty": Whether we know things or not (e.g. the future of the Middle East or China, the economic situation) – the two categories that have been used in defence planning.
- "Second-order uncertainty": Whether we know that we know (or do not know) those things. This addition reflects a greater sense of humility in our ability to discern what we actually know and what we do not.

These two dimensions of uncertainty are illustrated in the Rumsfeld Matrix as shown in Figure 1. Factors that affect the future defence requirements depend on both things we know, and things we do not know. Two-dimensionally, future challenges depend on things we know that we know (known knowns), things that we do not know that we know (unknown knowns), things we know that we do not know (known unknowns) and things that we do not know that we do not know (unknown unknowns), shown in the bottom right corner. The unknown unknowns, known as the black swans, are the rare, unexpected and totally unpredicted events, but could have an extreme impact. In spite of its outlier status human nature makes us concoct explanations for its occurrence, and tend to make it predictable in hindsight [8]. Planning for security challenges that may appear 20–30 years ahead, naturally imply a high degree of uncertainty.

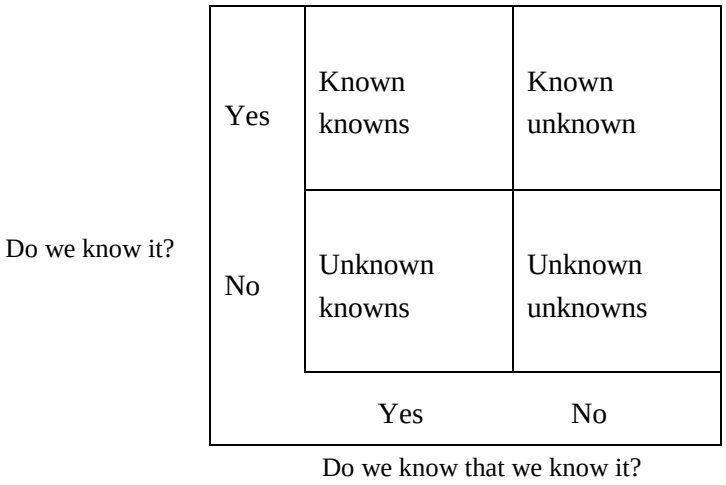

Figure 1.1 The Rumsfeldian uncertainty matrix.

When confronted with the unknown, which is to say the future, we feel most comfortable assuming that present conditions will persist. In other words, we assume that we, with some level of precision can predict the future. Knowledge about the future is also the basis for risk analyses and planning, where the aim is to reduce risk within own organisation and in which we attempt to predict the likelihood of events. According to Taleb traditional risk analysis and management fail

to see the big events that the black swans represent, as they fall outside our imagination, even if they may change our lives and society [8]. The rarity of these events makes it impossible to predict when and where the birds will hit next time.

We therefore tend to plan and prepare our defence for the known challenges, challenges that still are possible. Unfortunately, we may end up advising decision makers to develop a defence with little robustness with regard to these black swans.

2 The Norwegian long term defence planning method

To meet the objectives listed above, FFI has established a capability- and scenario based method for long term defence planning. This method includes both scenario analysis and force structure analysis, as illustrated in Figure 2.1 [2]. The method is also similar to NATO's Capabilities Requirement Review (CRR), though with a few national adaptations. Another similar method is defined in "Handbook in long term defence planning" [9].

The part of the Norwegian method that regards the force structure analysis is a bottom-up process that aims to identify the capabilities and costs of the current and future force structure elements. The scenario analysis is, on the other hand, a top-down process where we develop capability requirements from the national security situation, future challenges and strategic aims. This article focuses in particular on the scenario analysis.

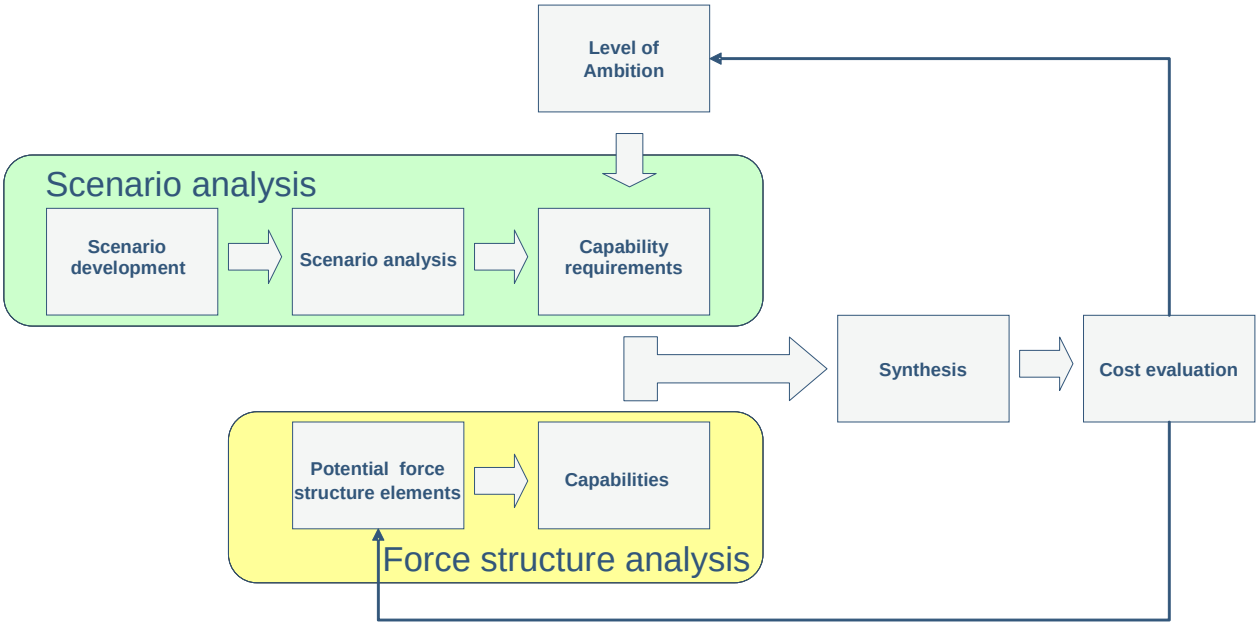

Figure 2.1 The figure illustrates the process flow and basic components of FFI's long term defence planning method.

2.1 Scenario analysis

Capability requirements are derived from an analysis of the national security situation, future challenges and national strategy. For the derivation, it is critical to be as open-minded as possible, and we aim for a set of mission types that spans the space of potential future challenges to national security. The mission types are generic scenarios and do not contain details regarding parameters such as time, place or opponent. Examples of mission types could be "Collective Defence" or "Crisis Containment". Both national and international challenges are taken into account to develop the current set of mission types. In order to derive meaningful capability requirements, it is necessary to develop concrete situations, scenarios, within each mission type, where geography, actors and time lines are defined.

The scenario analysis consists mainly of a decomposition of each mission type into objectives, tasks and subtasks. The subtasks are then analysed to determine the capability requirements for each of them. This can for instance be accomplished through war-gaming, simulation models and/or the application of doctrine.

The capability requirements derived for each subtasks is mission type specific and applied to each scenario of that mission type. The details associated with each scenario will influence the size of the capability requirements (some of which may be zero), but not the type of capabilities required. Another way of putting this is that the concept of operations is determined at the mission type – not the scenario-level.

2.2 Capability based planning

Over the past decade, Capability based planning has become the standard in defence planning in several countries within the NATO-alliance. A capability is the operational ability to perform a certain task [10]. In a capability based approach a number defined capability categories (collection or package of capabilities) is used both to express requirements derived from scenarios and the abilities of units and platforms. This gives us flexibility in matching units and platforms to requirements and avoids zeroing in on specific solutions too early in the process.

2.3 Level of ambition

One of the more important benefits of a structured defence analysis is that it entails a concrete formulation of the level of ambition with respect to a national defence policy. The actual level of ambition is unfortunately rarely defined in a precise manner by high-level political decision makers. However, a given force structure represents a level of ambition that can be demonstrated and clarified through scenario analyses. This is the approach taken in FFI's support to MoD's long term planning process.

The level of ambition is defined by a set of mission types and scenarios (including concurrency) that the future defence force should be able to handle. This will, together with a force structure cost analysis, give a relatively precise description of the consequences of the strategic choices and trade-offs, assuming the assessment of the future security situation is reasonably correct. The

level of ambition, together with the capability requirements from the scenarios, gives the total capability requirements that the force structure must fulfill.

2.4 Force structure analysis and costing

In order to establish how well a force structure matches the capability requirements we identified through the scenario analysis, the force structure elements must be characterised using the same capability categories.

A force structure consists of elements that are qualitatively different. Some of these can still have the same or similar capabilities. A Coast Guard ship and a P-3C Orion can, for instance, both do maritime surveillance. To be able to compare the surveillance capability of these two platforms we need a yardstick to measure it with, a reference unit. The reference unit defines a unit of performance (or capacity) for that particular capability category. The reference unit for the capability category maritime surveillance could either be defined as a certain performance level (the ability to survey a certain area with a certain resolution within a defined period of time) or it could be defined to be equal to the surveillance performance of a known platform, such as the P-3C. All platforms and units that have a given capability must then be evaluated in terms of their relative performance as compared to the reference unit of the capability category [11].

Cost estimates are part of the overall analysis at two different stages. One is the total force structure cost analysis and one is the life cycle cost analysis with regard to individual force elements. In order to evaluate the cost effectiveness of a particular unit or platform compared with any other then both its capabilities and its costs must be estimated. Both of these stages are accounted for in our current method, as indicated in Figure 2.1. In the current paper, we will not look in more detail on the risk represented in economic questions regarding the long term defence planning method. However, the economic aspects of the method and uncertainty related to life cycle costs are discussed in [3] and [12], respectively.

Based on the methodically objectives regarding future security challenges and capability based planning, we have identified and evaluated our current method for long term defence planning with regards to the uncertainty and shortcoming, and hence to the risk of contributing to a strategically irrelevant development of the military structure.

3 Evaluation of the method

Initially we defined the overarching goal for our defence planning method, namely to define a defence structure that is both robust and flexible with regards to changes in level of ambition, economy and changing security environments, but which also is a cost efficient force structure solution with respect to the assumed values of these parameters. Two of the main elements of this method have been evaluated in terms of uncertainties and risk: identifying future security challenges and the capability based requirements.

3.1 Identifying potential future security challenges

A main objective is that a long term defence planning method should identify and concretise the security challenges that the nation may face in the future, in times of peace, crisis and war, within and outside our immediate environment. Uncertainties described in this section regard the data that goes into our long term defence planning model.

Scenario analysis is part of the capability based planning method, and has for several years been a major part of long term defence planning in Norway. Although scenario planning does not give accurate advance knowledge of the future, it can make us better prepared for the future when it begins to materialize. That is, if we manage to understand, identify and concretize the potential future security challenges. Currently, FFI does this by using a foresight method, more specifically morphological analysis, as illustrated in Table 3.1 [13, 14]. The four parameters, Actor, Objective, Method and Means, are the main variables that describe the potential security challenges. For each of these parameters, the possible values are identified, and we obtain a huge number of possible parameter value combinations. By the values identified, as shown in Table 1, there are 768 theoretically possible parameter value combinations.

To identify consistent parameter value combinations, one evaluates whether two values within different parameters can take place at the same time. By identifying inconsistent combinations of parameter values, the number of combinations is reduced. Based on each consistent set of parameter value combinations, scenario classes, or mission types are developed. Scenario classes constitute broad categories of challenges, and contain, in principle, an unlimited number of specific scenarios. The complete set of scenario classes does in principle cover the entire spectrum of possible future challenges to Norway, a set of mission types that we assume to be exhaustive. Our current six scenario classes does not include the large scale Cold war type

ACTOR	GOAL	METHOD	MEANS
State / group of states	Occupation / Regime change	Military control of entire NOR territory	Large scale military efforts
Network	Political coercion	Military control of parts of NOR territory	Limited scale military efforts
Company / organised group	Military exercise / Intelligence gathering	Deny / disturb NOR military operations	Large scale non-military efforts
Single individual	Economic gain	Symbolic use of force	Limited scale non-military efforts
		Routine military activities	Economic sanctions
		Attack against NOR infrastructure / citizens	Other
		Economic use of force	
		Criminality	

Table 3.1 Morphological matrix with an overview of all the parameters and values used in the Norwegian defence planning method [13].

military aggression against Norway, as it lies beyond the scope of what is assumed to be possible in the foreseeable future. However, a series of limited military challenges as well as terrorist threats are considered still to be possible. The six scenario classes identified are: Strategic attack (I), Limited attack (II), Coercive diplomacy (III), Terrorist attack (IV), Criminality (V) and Military peace-time operations (VI) [13]. Within each scenario class one or more scenarios are developed. A thorough formulation of the scenarios has been developed by FFI in collaboration with the Norwegian Intelligence Service, which makes it possible to increase traceability and internal consistency throughout the scenario analysis, and hence reduce inherent uncertainties. These scenarios mirror our primary concern, namely challenges that represent a threat to the Norwegian territory, to the Norwegian population, or to the ability of the Norwegian authorities to implement political decisions and to maintain Norwegian jurisdiction in areas where we claim sovereignty.

3.2 Uncertainties in own method – in Rumsfeldian terms

The challenges we have included in our defence analysis varies in range from peacetime operations and operations due to extreme weather to strategic assault. The set of scenarios that we have chosen to take into account represents both *known knowns* and *known unknowns* in Rumsfeld's uncertainty matrix shown in Figure 1.1. In our view, peacetime tasks are the only military "challenges" that lies within the known knowns-quadrant. These include the everyday tasks for certain military units, like intelligence and search and rescue. The defined policy and level of ambition are other factors within the known knowns-quadrant that affect the long term defence planning. The level of ambition regarding both readiness and regarding endurance within the various scenario classes are expressed, and are therefore guiding factors for the development of scenarios, scenario analysis and the capability requirement. It is necessary to update the known knowns frequently for these factors to be relevant for the current and future security challenges.

Known unknowns are situations we know about, but currently do not know whether is likely to happen or not, and represent the known space of possibilities that is not covered by the known knowns. The scenarios are examples of these challenges, and except from peacetime tasks, all the scenarios used for FFI's defence analysis lies within the known unknown quadrant. Furthermore, all the parameters used to define the scenario classes: actor, goal, method and means are based on assumptions that are also within the known unknowns-quadrant. Similarly, the explicitly expressed assumptions we make throughout the scenario analyses also belong to this quadrant. One of several assumptions the Norwegian defence planning include, is the military support from Nato if there is an attack on Norwegian territory. An alteration of Nato's role, or if for instance Nato should in effect cease to exist, would have a huge impact on the basis for defence planning throughout Nato-nations. Another assumption we make is that the current set of scenario classes is exhaustive and that our set of scenarios span the space of challenge within each scenario class, which may be valid in the short term. In the long term, however, there is still the possibility that the set of scenario classes is not exhaustive.

Our assumptions tend to blind us from the fact that uncertainties exist, and we may ignore critical challenges between point scenarios. Uncertainties regarding both the set of scenarios and the

assumptions we make have methodical and strategic consequences: it may change the basis for our scenario classes and our developed scenarios. Strategic consequences may be even more serious, as our defence analysis may lead towards an irrelevant military force, and hence we are far from reaching our overarching goal.

The risk connected to the presence of known unknowns can be reduced by transforming them into known knowns, if possible. This can be done by gaining more knowledge and understanding about the unknowns, and to a greater extent include more of the transformed knowns in our analysis. One way to increase our knowledge about the known unknowns would be to do separate studies of issues we know too little about. Multi-scenario analysis would also give valuable information about a greater range of security challenges. Over the last few years, FFI has started to develop more scenarios for defence planning within all the six scenario classes we have defined, and hence increased the variation of the challenges we analyse for. Additional actions to be taken in order to transform known unknowns to known knowns would be to vary assumptions regarding the intensity and duration of all our scenarios in order to do sensitivity analysis on our current assumptions. By varying the intensity and the duration of the operations in the different scenarios, the capability requirements will vary correspondingly, resulting in force structure solutions that are more resilient than solutions that are identified from point scenario analysis. Sensitivity analyses will therefore give information on how vulnerable the current and planned force structure is to a variation of seriousness of the challenges.

Introducing trend analysis would improve the overall understanding of potential future challenges. Trend analysis can contribute to increase our understanding and preparedness for the known unknowns and consequently increase the robustness of our method – the basis for our advice to the Norwegian MoD – and hence reduce the overall strategic risks. Trend analysis has recently been introduced in a current study on FFI that addresses some of the challenges the Norwegian Land Forces may be facing in the future [15]. In his report, Norheim-Martinsen is concerned about the fact that although we have a set of international scenarios that we test our force structure against, the international operations are expressed not to be dimensioning for the military structure. He argues that due to a probable increase in future contributions to international military operations, international scenarios should be a separate scenario class that we take into account in the national ambition level, and hence takes into account when estimating the capability requirements [15]. Furthermore, he argues that this action would reduce the risk inherent in preparing our military force for national challenges, only, while mainly operating internationally.

The challenges that we analyse generally represent threats to the Norwegian territory or to the Norwegian people, challenges that are assumed to be possible in the security environment of the medium-term future security picture, and that are within the defined level of ambition [16]. Other challenges within the known unknown quadrant that are more extensive, including for instance a cold war type invasion or nuclear war, are assumed to be highly unlikely, and are therefore not represented in our set of scenarios. Along with potential challenges like Arctic operations due to climate change, one could still develop alternative futures-scenarios to fully explore the space of

the known unknowns, since the projected trends may be disrupted by some unforeseen event. The effect of analyzing alternative futures will not necessarily give an accurate picture of tomorrow. Nevertheless, we claim that the awareness of alternative futures will give a better basis for robust and flexible decisions about the future.

Unknown unknowns, or the black swans, are the highly unlikely situations that still have a major impact. By definition, we obviously do not know which events these unknown unknowns represent. Black swans are therefore not taken into account at any stage of the long term defence planning method. One might argue that the current ambition level is at or above what we are able to handle anyway, so focusing on the black swans would be a waste of time and resources. Still, we should be prepared, at least mentally, for the unknown unknowns in a risk based defence planning method. Since we currently do not try to include the unknown unknowns, there's a risk that our defence structure become strategically vulnerable. By adding "wild card" scenarios to represent the black swans as test-scenarios we could evaluate the robustness of the current and future force structures [15]. These actions would, make the defence planner, the decision makers and the military organization more aware of the threat of the black swans.

Recently, some initiatives have been launched to address uncertainties in the Norwegian long term defence method. To allow for a certain degree of agility in tackling changing security and/or economic environments, the Norwegian MoD has currently moved away from a traditional four-year cyclical model of long term planning towards a continuous planning model. In this model, plans are developed and updated as required, which improves continuity in terms of methods and personnel, since there is no need to establish an ad-hoc organization every fourth year that inevitably tries to reinvent the wheel each time. The main concern, however, is that a continuous process could fail to discover and act upon what could be called "creeping change"[17]: If the security environment should undergo a gradual change to the worse (or better), the natural response would be a gradual change and adjustment of the long term plans. The security environment may, through gradual change, have altered in a fundamental way without us realizing it. While the continuous model is an improvement from the old model, which offered limited opportunity to address evolving challenges, the need for some sort of activity that counters the inherent danger of being caught up in current events and day-to-day planning has become more obvious [17].

3.3 Capability Based Requirements

The second main element of our long term defense planning method is that the method should be capability based, i.e. seek to establish the required defence capabilities before explicit solutions in terms of platforms and units are specified [2].

As well as identifying potential future security challenges, we have also chosen a method that is capability based to be able to define the optimal force structure. The idea is to focus on capability packages that are derived from scenario spaces, and not single scenarios. This framework basically starts with what needs to be done and derives a force structure that can do that through a transparent and traceable analytical process. Through scenario analysis, a group of experts

evaluate and decide what needs to be done at the various levels. Identification of high level tasks like “Support the force” and “Establish command and control” are decomposed into a hierarchy where low level tasks like “maintain tactical air C2” are the lowest level. Based on analysis of the low-level tasks we are able to identify and quantify capability requirements.

Although the capabilities represent a bridge connecting the tasks (what we need to do) to capabilities (how to do it), the number of capabilities has to be well adjusted. There is a risk that the capabilities become too specific if we have defined too many capabilities. The consequence may be that the capabilities are identical to particular structural elements, which takes away the flexibility we aim for. Currently, FFI has a list of 92 capabilities, in which most capabilities are instantiated by more than one structural element. Still, a few capabilities are represented by only one military force element. Conversely, if there are too few capabilities it may become impossible to specify capability requirements as the requirements get too vague. The overall consequences of an imbalanced number of capabilities may be incorrect force element analysis. An example would be a capability called ISTAR, assuming that all ISTAR elements can do the same low level tasks, which obviously is incorrect. A continuous review is necessary to minimize this concern.

Subject matter experts have evaluated the military platforms and units that have a given capability in terms of performance relative to the reference unit of the capability category. This relative value is a specific number which is naturally colored by how many and which individuals did these evaluations. If these values are wrongly evaluated, the consequences may be that FFI recommends a long term force structure that is a less balanced, or less cost effective than the optimal one. We suggest two actions that can be taken in order to reduce this uncertainty: Firstly, instead of using single reference values we suggest an introduction of probability distribution. There is uncertainty connected to the relative value, and hence it should not be more accurate than the accuracy we are able to evaluate. Unfortunately, our current planning tools do not have the capacity to handle probability distributions. Besides, using distributions would make the problem to be solved very large. One way to reduce problem size and still take account of the uncertainties is to use a one-way sensitivity analysis, a method in which only one parameter is varied at time. This simplified sensitivity analysis allows us to assess the impact that changes in a certain parameter will have on the resulting capability requirements and force structure identification. As well as using subject matter experts to evaluate the military performance, in-depth-analysis of lower level tasks would further substantiate our defined reference values, and hence reduce inherent uncertainties.

As we have indicated above, scenario analysis may be an uncertain basis for capability requirements, even if the framework for our scenario analysis is both traceable and internally consistent. Additionally, there will always be a risk that the scenario teams’ evaluations are subjective rather than objective, based on their prior knowledge and experience. However, through the analysis process we aim for a broad participation by up to 30 representatives from the military branches, the intelligence service, the joint operational HQ, as well as the MoD, to minimize such uncertainty. A further reduction of this uncertainty would be obtained by including more people in our scenario analysis, by allowing for variance in capability requirements if there is a

significant difference between the participating scenario teams, as well as doing separate analysis in order to increase our understanding of the key tasks.

4 Conclusion

Is the Norwegian defence planning method risk based? Although not explicitly, risk is to a certain extent taken into account and mitigated in FFI's current long term defence planning method. First of all risk is reduced in our method since being able to trace capability requirements back to the military task through our multi-step method. Risk is reduced by analyzing capability requirements based on 16 scenarios within six scenario classes, which increase the flexibility of the resulting recommended force structure. Furthermore, uncertainty is reduced with regard to tackling a changing security and/or economic environment, by moving away from a traditional four-year cyclical model towards a more continuous planning model. We therefore claim that the Norwegian long term defence method is partly risk based.

Still, because of the multifaceted uncertainties in long term planning, risk awareness is necessary, and our method would improve if we included risk considerations to a greater extent. Introducing sensitivity analysis on all the scenarios and on the relative value of the capabilities would make a more robust method for long term defence planning, resulting in a set of future requirements with increased flexibility. We also argue that gaining knowledge and thereby reducing uncertainty of, or the impact of, the known unknowns, will give a more secure basis that will reduce risk connected to relevancy and extent of security challenges. Lastly, we argue that risk based defence planning should evaluate the robustness of the current and future force structures against black swans by testing the force structure against "wild card" scenarios.

The suggested actions would reduce the uncertainty and increase the robustness of FFI's long term planning. Although we cannot make plans for every potential strategic shock, risk based planning will to a greater extent take such events into account, increase the robustness of the method, and give the basis for identifying a more flexible force structure.

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