The battle for Svalbard, 2030
Norwegian or Russian dominance?

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Summary

This thesis addresses the contribution and role of the Royal Norwegian Navy in een crisis situatie in het hoge noorden, evenals de capaciteit en capaciteit challenges it faces meeting the potential threats in the region. The study highlights de konsekvenser af afslutningen af den russiske statens armament Program on the Navy's ability to counter a Russian security threat against Norwegian sovereignty over the Svalbard Archipelago. To address these problems, a future scenario in 2030 is outlined, involving a simultaneous incident in the Baltics and a potential spillover to the High North. De studie's belangrijkste bevindingen zijn de ernstige gevolgen van moderne conventionele precision-guided missiles on a surface fleet's ability to perform in a contested theater of operations, as well as the vulnerability of Norwegian naval forces due to a limited number of bases. Submarines equipped with long Range anti-surface and land-attack capability are major assets to establish a military threshold against Russian aggression. In addition, the self-protection De maatregelen van de oppervlaktes moeten aanzienlijk worden verbeterd safe operations in a future threat environment.

Keywords: High North, Svalbard Archipelago, Arctic, Russian Navy, Norwegian Navy, Submarine, NSM, Maritime Competition, Navy, Tomahawk, F-35, Admiral Gorshkov class, Nansen class, Skjold class, Kalibr, S-500, Oniks, military threshold, realism, norway, russia
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Dear reader! In this year's first issue of Military Studies we focus on the defense's ability to safeguard Norwegian interests in Svalbard. One of the most important funds is Norwegian forces that ultimately can affect whether Russia should use military force or a. This can sound dramatically, because Norway and Russia have had generations for generations a strong interest society in the north. At the same time, Norway's NATO membership does Russia first and foremost looks at the country to the west as a potential threat, especially in periods where the security policy climate between east and west is called. In today's world, a crisis between NATO and Russia, for example in the Baltic Sea, quickly affect the stability of our own backyard. Norway is after all just twelve miles from a standing Russian nuclear weapon. It is in such situations that The Norwegian Armed Forces were put to the test. The point is not necessarily to prevent conventional raid and limited attacks on military targets in Norwegian territory, but to resist political pressure. If Russia estimates that a serious crisis is in notify, the requirement to withdraw Norwegian forces further away from the base complex at Kola probably sit loose. If there is a tug between Norway and Russia, access to credible forces will be crucial. It is in this perspective we must see the need for Norwegian submarines as one of the threshold defense most important platforms. Without access to air and sea based platforms with long-range, precision-controlled missiles, Norway will in the future not be able to affect the Russian diet / benefit calculation. For that, the Norwegian defense is too small, too vulnerable and too conventionally geared for small tactical blows. Thus will We also stand weak the day crises in other countries send ring effects into their own neighboring areas. At a time when military means again have become a natural feature of states foreign policy, even in one of Europe's most peaceful corners, this is serious. The art is to have low signature platforms, which nobody knows where is located, but as nevertheless, it may cause the opposite party to incur high costs if someone chooses to challenge Norwegian interests. This is what creates credible deterrence, which also provides small states political freedom of action in meeting with major states in international politics.

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Chapter 1 Norway, Russia and north

In 2005, the government Stoltenberg launched the northern areas as Norway's most important geographical focus area (Stoltenberg II Government, 2005). The occasion was on ice melting and energy resources, which would lead to new challenges and opportunities in the region. The idea of major changes on cards was not turned on. Probably it will still take many years before it will a more dramatic shift in the Arctic will take place. From a security and military perspective, however, development may be said to have gone faster than expected.

Superpower and small state

Russia is still the key challenge in the north. World largest country feels more surrounded than before, which has led to one more expansive foreign policy. For the first time since WWII have a country in Europe taken over parts of territory to another, which is one clear violation of international law (Intelligence Service, 2015, p. 3). The Russian annexation of the Crimea Peninsula and subsequent invasion of Eastern Ukraine spring 2014 has caused uncertainty among several European peripheral states about the superpower further intentions. The news about a possible Russian submarine in Swedish waters autumn 2014 1 built up under this uncertainty; as well as an increased number border violations of Swedish and Finnish airspace. Although some of the rumors of aggressive military advancement in the north proved to be false alarm, it is a fact that Russia's flights along Norwegian airspace since 2007 is back to the highest level we have experienced since the Cold War. Whether NATO membership, UN sanctions or others International agreements will create necessary Norwegian security against a possible Russian expansion is a daily issue. Russia's rhetoric against the West has become sharper and testifies to a country like want to be heard as a superpower. An extensive military weapon program, GPV 2020 has since its launch in 2008 led to extensive upgrading and modernization of the military force. The cost is 3500 billion Norwegian kroner, and the effect of modernization is significant. Russia has through its appearance shown that it is a powerful military force with one big power register to play on. Russia's ability to use comprehensive political, Military, economic and civilian instruments help to weaken the unity and the power on the western side. Russia obviously wants to recreate the Soviet grandeur and secure a buffer zone against NATO. Russia's military modernization, combined with the ability to quickly deploy of forces constitutes a significant security threat from a country whose intentions is uncertain. For Norway and NATO, Russian modernization means that A future conflict can now develop on days and hours. The meaning of Norwegian forces that can respond quickly and constitute a deterrent threshold Russia from a further offensive is therefore more current than ever before. 1 See, for example, Sveen and Mogen, 2014.
Conflict scenario at Svalbard

If there is a security crisis local or regional there Russia is involved, this can primarily be meant for Norway challenges related to Svalbard. Since 2011, Norway has no longer one. Obviously, the border with Russia in the east. However, Norway is located in the middle of rolling line to the Russian bastion defense and neighboring the Kola-based Russian North Fleet. Svalbard is important with its geostrategic location a possible deployment of the bastion defense. The archipelago is under Norwegian jurisdiction and sovereignty, as declared by the Svalbard Treaty of 1920. However, not all treaties agree with the Norwegian interpretation of Treaty. Svalbard can thus be a vulnerable point for Norway if other nations should challenge Norwegian sovereignty over the archipelago. It may be unclear from who and in what cases Norway can expect support from Allies in the event of a challenge to Norwegian sovereignty on and at Svalbard. How serious must a security policy crisis be that Norway will not power to handle it alone? Who is supposed to support Norway, and the support will be prioritized if it also presents a security policy crisis in it central Europe? The conflict potential in the High North consists primarily of a possible "spillover" from crises or armed conflicts originating elsewhere (Offerdal, 2014, p. 92). The potential danger of a security policy smear effect from crises or conflicts elsewhere in Europe makes it interesting to explore A hypothetical case, a case study, where a scenario forms the framework for one possible security crisis between Norway and Russia in the High North at Svalbard. The scenario makes it possible to illuminate the consequences of the North Fleet assumed capacities, more specifically how these will affect the Norwegian Navy contribution to a possible security crisis in the north. In order to create a scenario that takes into account the consequences of the modernization program, I have chosen a situation a bit ahead of time. At the same time as that Russian program makes great progress, there is also a risk of delays as a result of setbacks in the economy and industry, and a shift of the end of the program from 2020 to 2025 or later is therefore plausible. At the same time, the question of the Norwegian Armed Forces' further development in Norway is being investigated (in line with the report A joint lift ) and the preparation of a new professional milestones council. Technological innovations and lead times on defense development make that concepts currently on the drawing board probably do not see the light of the day before 10-15 years. The scenario is therefore added to the year 2030.

Problem, method and structure

This study is about how the Armed Forces can handle a thought security crisis and armed conflict in the High North. The study will primarily concerned with the role of the Navy, but within a common operational framework. The Air Force, and to a lesser extent, the Army will therefore also be withdrawn. NATO's collective efforts
through Article 5 will not be included in the discussion to a small extent, among other things because the study has its focus in the tension between crisis and armed conflict. A two-tier issue is selected:

1. What is the Navy's contribution and role in a security policy crisis and armed conflict in the highlands?

2. What capability and capacity gap exists in the Navy in relation to the threat picture in North?

The problem poses the basis for a case study (case study) which discusses the Armed Forces various contributions and roles, with a focus on the Navy. This forms the basis for the second part of the issue, which is An analysis that considered needs and existing capacities were considered against each other. The case for a case study is that there may be many more variables of interest than what is available from data available from one source. More sources should therefore be used to gather and triangulate data and exploit results and theories from other analyzes (Yin, 2009, p. 18). This study, which looks at one Case on time will have an exploratory method with a holistic design. The The empirical basis is made up of openly available information. As regards the North Fleet and future Russian capabilities, it is essentially used reports on the Russian military modernization program GPV 2020 and member databases such as The Military Balance 2015 (IISS) and IHS- Janes. On Norwegian side, the Intelligence Service's assessment (FOKUS 2015), Expert group report A joint lift and the Armed Forces annual report (2014) provided important contribution. Data from different sources has been triangulated in order to minimize error sources. Own experiences from the Navy about general principles for the use of weapon systems is drawn into reflections around this. Where I have referred to video footage as an elaboration of described capacities, Links to these are posted in footnotes on the current and not in the bibliography. The review of available weapon systems is characterized by a number of abbreviations. These are summarized in the back of a list to facilitate the overview. Of other studies written about military power in the High North, it is did not find anyone who specifically analyzes the role and capacity of the Navy in one possible future security policy crisis with Russia. Current studies rather deals with the use of air force in the High North and the potential for security crisis between Norway and Russia (Kaagaard, 2009; Øversveen, 2007). The purpose of this analysis is therefore to shed light on how, and with what military means, a possible security policy crisis in the High North between Norway and Russia can be seen in the future. The background material is as far as possible based on current military modernization plans and technology that exists or is at the research stage today. The study will not go into a development where NATO's article 5 2 becomes triggered and allies involved. It primarily aims to show which ones Potential Challenges The Armed Forces and the Navy are facing alone, before the situation.
can evolve into Article 5. The purpose is to account for Norway's capabilities and their significance for the described case. Action in security policy crises consists of both will and ability to react. This study will not go further into the politicians' will to apply military means, but concentrate on the ability of the military. The capacities have in the described scenario and the consequences this can lead. 2 NATO's Article 5 states that an attack on a member state is an attack on the entire alliance.

The study consists of four main chapters. Chapter 1 deals with the rationale for the scenario and how this stands in relation to realism and Geoffrey Tills modern maritime power perspective. This section appears in the scenario description in Chapter 2, which also addresses actual outcomes in the scenario. Specific It is about the role and capacities of the Norwegian Navy, as well Russia's capabilities, today and in the future. Chapter 3 goes further on the consequences of the chosen Norwegian structure and the Russian capacity for Norway. Chapter 4 is devoted to an analysis of the gap between present and future capacities in the Navy. The study concludes with a summary and discussion of the findings, followed by some suggestions for further research.

**Theoretical approach to the scenario**

In this following I will establish a theoretical framework for the further study. Following a conceptual explanation regarding security policy, crisis and conflict becomes the anarchic aspects of realism with regard to Russia. Next, the short safety dilemma that has characterized Norway's relations is described to Russia, to give a perspective on the neighborhood of the small state to the great power. For to link realism with the maritime domain of security policy, I would like to draw in the maritime power perspectives of the British naval historian Geoffrey Till, followed by some key seismic theoretic concepts. The expanded concept of security policy is linked to realism and until sea power perspectives form the basis for the review of Svalbard scenario chosen for study analysis.

**What is security policy?**

The term security policy has gained importance during the period after the end of the Cold War. According to researcher Jon Kristen Skogan revolves Security policy is traditionally about "achieving protection for your own." land against physical abuse and violence from outside, in practice often armed, military use of power (...) from another state or from a non-governmental organization or group »(Skogan, 2011, pp. 101-102). This understanding is rational to use drastic means, including military, to defend the nation territorial integrity and sovereign rights. State security is central to this understanding. In the extended sense, we would like to talk about a negative and a positive understanding of the term security policy (ibid., p. 104). The negative understanding includes Threats like security policy are meant to protect against. The expansion also includes internal threats that do not directly threaten the sovereignty of the state, as well as regional threats.
through the protection of an alliance's area of responsibility. The positive definition is about what values the security policy is intended to protect. It's about core values and vital interests for the country, as "peace, sovereignty of the country, its territorial integrity, as well as national freedom of action »(ibid.). Community security and human security are included. In other words, in the positive definition. From the mid 90's until today, Norway can be claimed to have gone from an expanded negative approach to security policy, to an expanded positive approach. However, important events in 2014-2015, especially developments in Russia, speak for Norway's security policy is about to Return to an extended negative approach to the term.

Crisis versus conflict

What characterizes a security policy crisis and when does a crisis arise conflict? According to the report A joint lift, a security crisis is an event "Which challenges the state's territorial integrity and political sovereignty, but without a military attack in the traditional sense " (Expert Group for the Norwegian Armed Forces, 2015). Such a crisis points to one Unclear situation where the potential for escalation is large and wherever it may be unclear which actors are behind. 18 A Russian maritime Navy control operation in the fishing zone could be indicating a situation that can easily escalate into an armed conflict. IN After the Second World War there are no examples of one European Nation has declared war against another, as international law defines the concept of war. However, there have been many armed conflicts that can be defined like warlike conditions and serious estimates. In the study both terms will be used War and armed conflict are used.

Realism and Russia

One of Realism's founders is the state writer Hans Morgenthau (1904-1980), which stated that international politics was about a struggle for power. According to Morgendau reflected the nature of this human being, as man after his sight was driven by a search for power. Critics of Morgenthau have pointed out that This view of humanity becomes too narrow and envy, and later theorists within International politics has focused less on the search for power. Kenneth Waltz (1924-2013), known as the founder of New Realism, laid the main emphasis on the international system structure. While states in the Morgenthau's world are power-seeking and driven by ambitions, states in the Waltz world are driven by a search for security and a fear of other states' aspirations (Williams, 2006, pp. 12-13). Waltz's perspective implies for the state that its own security depends on it relative power relationship with other states. Security at the expense of others is a way to strengthen the relative security of states. More safety for some mean less to others. The strong states offer protection for the weak. The states, which in turn seek security through alliances. Such may be small states ensure the influence and ability to manipulate major states (ibid., p. 92). This can be claimed to be the case for
Norway, which has applied for protection from the United States and NATO to secure security against the Soviet Union and Russia. Small states role in the international system demonstrates in many ways Thukydids postulated that the powerful party in a conflict will always win while it weak bend under: "... those who have power, demand what they can achieve, and they weakly agree In any case, the small state needs stability as a security for further existence. Russia under Vladimir Putin can be analyzed in a realistic perspective. After the Soviet Union's dissolution, the country was in a deep crisis in the 90's. After the millennium, Russia has slowly rebuilt itself as a great power and acting again according to a real-political tradition. Putin's actions can seen as a product of the system that formed the former KGB agent in Soviet era. Through its annexation of the Crimea in March 2014, Russia has shown that it has the ability and willingness to use military force in the territory of another state to earn their own interests. Russia is a strong opponent of the United States position as the unipolar hegemon. Instead, one seeks to promote a multipolar world order, with Russia as one of the main actors. This ambition is clearly displayed in the country foreign policy statements, where it is called:

... the foreign policy should be focused primarily on (...) and securing its high standing in the international community as one of the most influential and competitive poles of the modern world (Ministry of Foreign Affairs of The Russian Federation, 2013, p. 1).

The Annunciation of the Crimea and the invasion of Ukraine reflects the objective of to protect Russian minorities abroad, as mentioned in the same document. The actions of recent years show that Russia lives in a real political world where power rages and the strongest does what it takes to secure its own influence. How did Norway as a small state relate to this great power as a neighbor?  

The Norwegian security dilemma

Realism contributes to increased understanding also of Norwegian security policy. Important in This connection is Norway's distinctive security dilemma that comes to expression in a balance sheet policy. During the Cold War, Norway sought to balance between the deterrence of the Soviet Union on the one hand and calming it others. All the time, you had to consider how much ally activity could be allowed in Norwegian territory to have a deterrent effect on the Soviet Union, oppose measures to prevent a possible escalation in the north. Similarly searched Norway vis-à-vis NATO a trade between integrating alliance measures in order to contribute to the deterrence of the Soviet Union on the one hand, against the reassurance of Russians by means of anti-NATO protection measures on the other hand. As part of this balance policy, Norway also established self-imposed restrictions within basic policy and nuclear policy to soothe the Soviet Union. Ally flight ban east of 24 degrees and a ban on allied exercises in Finnmark ble also
introduced. At the same time, major allied exercises were conducted in Nordland and Troms to integrate and maintain alliance relations with NATO and the United States. The Norwegian invasion armed forces based on the Allied support for to handle the outer lines. Because of the threat to the transatlantic The supply lines were eventually established by large allied advance stocks in Norway, especially in Trøndelag, to support allied reinforcements of Norway (Terjesen, Kristiansen and Gjelsten, 2010, pp. 381-382). This has been a source of continuity in Norwegian security policy throughout the cold War. The typical balance policy can still be claimed to be applicable today. However, the power demonstrations of the last few years from the Russian side, together with the recognition of key actors that the Norwegian defense has released too far down, led to an ambition for an increased footprint in the north. We still do not know how strongly Russia will respond to increased presence in the northern areas with Norwegian navy vessels and other military units, as well major NATO exercises in the region. A taste bite on Russia's reactions in shape of balance of power and retaliatory policy can nevertheless be an unannounced one Preparedness exercise for the North Fleet was conducted only days after the Norwegian winter exercise "Joint Viking", which took place from 9th to 18th. March 2015. It seems like Norway's traditional security dilemma vis-à-vis Russia is most current today: Any Norwegian change in presence and action in the northern areas near the Russian Navy's main base will probably being guarded with argus eyes. Potential for misunderstandings, including that Defensive measures are perceived as offensive, ie an escalation of the other the party is absolutely present. 3

Geoffrey Till's perspectives on seaman power

Norway is a small nation with a large maritime footprint. 80 percent of Norway's resources come from the sea, and the protection and enforcement of Norway sovereignty and sovereign rights at sea are therefore extremely important. This Consideration has led to the maintenance of a balanced Navy. Geoffrey Till writes in his work Seapower about the evolution of the seaman in three perspectives: the pre-modern, the modern and the postmodern. The pre-modern perspective exemplified by weak states, states on the brink of collapse or states that have broken down. In the modern perspective, states are developing its navy to protect the sovereignty of the coastal state (Till, 2013, pp. 27-28). Modern naval powers can be claimed to protect their state security policy interests against external threats, as outlined through the forest's traditional understanding of security policy. The modern perspective can also be interpreted in an expanded negative understanding of security policy, through the handling of internal threats such as terrorism at sea and alliance contributions. sea power Mission in a modern perspective is about the ability to drive maritime control, maritime power projection, maritime law and order ("good order at sea ») and gunboat diplomacy (ibid., p. 32). The third perspective of the seaman is referred to as the postmodern. He claims that
geopolitical development features such as globalization and increasing economic dependence between states has led to the development of seaman power with the aim. FFI researcher Kristian Åtland highlights the security issue in its article "Interstate Relations in the Arctic: an emerging security dilemma? " (2014). Protection of the global trading system. Since about 90 percent of World trade is taking place, protects the global public emphasized as essential to maintaining free world trade and economic development. The global public domain means access to the oceans, airspace, space and cyber domain. This is specially drawn up in the US National Security Strategy (US President, 2010, p. 49). The seamen's mission in a postmodern perspective is sea control, expeditionary operations, stability operations and humanitarian assistance, "good order at sea and Navy diplomacy (Till, 2013, p. 35). There are few nations that have left the modern approach to seaman power and only acquired postmodern capacities - neither does it apply USA. It is true that Denmark has partly done this through procurement of mobile support vessels, which were intended to fill a role internationally in a NATO framework, as well as phasing out submarines early in the 2000s. Many coastal states, including Norway, have acquired vessels designed for one modern perspective that is also useful for postmodern perspectives. The Nansen Class Multi-Roller Regels are an example of this. A hypothesis may be that the majority of states with a naval navy acquire navy militia Material that is intended for a hybrid role, as it becomes too expensive to Build both types of capabilities. Another explanation is that the traditional Realism thinking is still inherent in most coastal states. Regardless has the importance of maintaining a modern naval power that is capable of to enforce Norwegian jurisdiction and territorial integrity has gained momentum and importance.

Seismic theoretic concepts

According to the Defense Joint Doctrine of the Armed Forces (FFOD), the sea forces are contributing for joint operations explained through three sea-force theoretical concepts: power projection, sea control and sea denial. Maritime power projection exists intends to apply or threaten to use seamen to influence operations and the situation on land. Such projection of power can take place as near or near remote projection. Near projection involves the safety of sea transport in order to Maintain social functions as well as insertion of amphibian forces or special forces in an area. Remote projection deals with the use of sea-based elongated weapons or organic air resources to directly influence land targets. Presence of sea forces in an area can be seen as one indirect form of power projection (Defense Staff, 2014, pp. 107-108). This can be exemplified by the presence of American aircraft carrier groups in areas where the US wants to exert influence, known as offshore balancing. Sea control is defined as "the state that exists when it is within Given limitations in degree, time and space, there is sufficient freedom of action to ensure the proper use of an area and, if necessary,
refuse one oppose this "(ibid., p. 108). This implies the protection of vessels and vessels Infrastructure on the surface and the seabed against threats from the air, the surface and under water. Sea control operations may include operations in all mentioned domains: antelope surgery, anti-surface surgery, anti-tubular surgery and mine clearance. The operations all have their own character and complexity. Under Operations where multiple domains are involved in the same operation theater the great command and control device requirements to avoid disadvantages situations, including that own forces engage each other. Denial of denial involves denying an opponent to exercise control in a marine area. At the same time, there is no requirement that one should be able to operate unobstructed in it same sea area. Therefore, denial of denial is a lower ambition than sea control and correspondingly less resource intensive. While sea control is an ambition must have control within all three domains of air, surface and underwater, Does it hold a denial ambition to have control in one of the domains (ibid., pp. 108-109). This can be achieved, for example, by mining a fjord.

**Svalbard as a scenario**

To define a scenario that emerges the Russian relationship The North Fleet and the Norwegian Navy have fallen on Svalbard. There are more 24 24 reasons for this. Firstly, the archipelago is from the Svalbard Treaty 1920 an area where there is no uniform international perception on resource management. Russia has a different interpretation of some paragraphs than Norway (Terjesen et al., 2010, p. 456). Nor is it a matter of course Norway that our allies will be supportive for a security policy challenge on or near the archipelago. The challenges will thus be more comprehensive than what our defense is designed for. In the scenario, a parallel event has been chosen by both the Baltic States and Svalbard are regions of a security policy crisis. This is done to find out that NATO nations may be forced to prioritize their contributions in the conflict. IN In a real policy perspective, nations would like to choose to contribute where it earns them most. Therefore, Norway will be able to experience a lower allied support in North than provided. Secondly, Svalbard is challenging in relation to infrastructure on land and seaside. There are great distances to the nearest civilization. Similarly, infrastructure is for monitoring and situation images is inadequate. Geostational satellites have coverage challenges in the Arctic due to inclination 4 , and polar rail satellites there are few of them. At the same time, equipment like GPS and dependent devices will be used This type of accuracy, be degraded around 80 degrees north. Third, Svalbard is in the middle of the first perimeter line for the Russian Northern Navy's bastion defense (see Figure 1). A natural consequence of a Russian Strengthening will be to ensure strategic opposition ability in the form of strategic submarines with intercontinental nuclear missiles. Northern Fleet existence is primarily based on this basis. When mobilizing the Nordflåten must Norway assumes that Russia will look after its first perimeter in order to protecting its strategic interests. Within
the outer perimeter of the bastion defense, which extends from the UK via Iceland to Greenland (GIUK gap), can Various denial operations are expected to ensure their own freedom of operation and the flow of military equipment between the Northern Fleet and the Baltic States. 4 Inclination: The angle between a ground magnetic power line and the horizontal plane.

Principal sketch of the Russian bastion and the extent of the bastion defense (A Common Lift, 2015, p. 20)

Fourth, a Svalbard scenario will hopefully reveal the addiction relationship between land, air and sea forces, and thus the importance of operating together to achieve the desired effect. Logistical challenges will also be visible in a different way than if the scenario had taken place in Finnmark, as has been the traditional cold war scenario.

**Scenario parameters**

The main purpose of choosing a scenario is to create a defined framework for to illuminate the two-part problem of the study: What is the Navy's contribution and role in a security crisis and armed conflict in the High North? And including: What capability and capacity gap exists in the Navy in relation to the threat in the High North? The answer to the problem depends on several factors. Firstly, what will equipment available and how this is used play a significant role for what the Armed Forces are able to accomplish. Secondly, the will and the ability to to use power
essentially. Decisions on a contemplated future situation represent a significant insecurity. One way to deal with this uncertainty is through use of scenarios: "A scenario postulates a future situation and server as a reference point in the future of decisions we make today »(Johansen, 2006, p. 3). As a tool in the process of defining a scenario, I have asked which ones security policy challenges that may arise in the north as a result of Robert J. Art (Professor of International Relations and Representative of New Realism) defines as a "spillover" from other areas. So the choice has fallen on one scenario where Norway is facing a security crisis with Russia. The Norwegian Defense Research Institute has a long tradition of development of scenarios. Through the background study that was prepared in connection With the Defense Study 2007, FFI has divided its military scenarios into six different classes. Scenario Class 1: Strategic Assault Scenario

Class 2: Limited Attack

Scenario 3: Commitment Diploma

Scenario 4: Terrorist attacks

Scenario 5: Crime

Scenario class 6: Military peace-keeping operations

Within each class, FFI has used the parameters player, goal, method and means to define the action room in the scenarios. In this study I have chosen to focus on scenario 2 and 3, since These appear to be most likely in a security crisis and one conflict scenario in the north. Although a full scale invasion is unlikely in Today's security policy landscape, points to both the Armed Forces and the politicians that the security policy cooperation between Russia and the West is permanently changed as a result of Russia's invasion of Ukraine (Bruun-Hanssen, 2015; Intelligence Service, 2015; Søreide, 2015). This cooling in The neighboring relationship implies an increased risk of misunderstanding, escalation and unwantedness events. This could in the worst case lead to war (Jervis, 2006, pp. 500-501).

According to FFIs 4 measurement parameters actor, goals, method and means have I set up a tabular representation of the parameters for the described scenario.

**Performance indicator** Outcome

**Actor** Russia

**Ends** Secure the supply lines of the Russian North Fleet against Norwegian and Allied Interference. Extend the safety of the North Fleet using Svalbard as a base and at the same time establish a military footing on the archipelago.
Ways Exercise military pressure in the fishermen's zone around Svalbard, to work on sea trout troll within the maritime areas defined by the Russian bastion defense and challenge Norwegian sovereignty in Svalbard.

Means Presence of surface units from the North Fleet, as well as air surveillance of the area the. Hidden militarization in Barentsburg. Proliferation of Norway against interference.

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<thead>
<tr>
<th>Måleparameter</th>
<th>Utfall</th>
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<tbody>
<tr>
<td>Akter</td>
<td>Russland</td>
</tr>
<tr>
<td>Metode</td>
<td>Utøve militært press i fiskevernsonen rundt Svalbard, for å opparbeide seg sjakontroll innenfor sjøområdene definert av det russiske bastionforsvaret og utfordre norsk suverenitet på Svalbard.</td>
</tr>
<tr>
<td>Middel</td>
<td>Tilstedeværelse med overflateenheter fra Nordflåten, samt luftovervåkning av området. Skjult militarisering i Barentsburg. Avskrekking av Norge mot innblanding.</td>
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Summary

The foreign policy development in Russia in the years 2014-2015 has contributed strongly to the fact that state security has again become more prominent in Norwegian security policy. Norway is a small state in the international system and has traditionally sought protection from the United States and NATO to achieve security against Soviet Union and Russia. Norway's handling of security à-vis neighbor in the east, which is expressed in a balance sheet policy, deterrence of Russia through national defense and NATO integration on the one hand and tranquility of Russia through anti-NATO anti-detention measures The other side has represented a continuity in Norwegian security policy entirely since the cold war. Norway has developed a navy that is in line with the naval theorist Geoffrey until modern perspective, but the Navy also has a hybrid role in the form of the ability to be used in postmodern roles. This is indicative of Most nations with marinas today, mainly for economic reasons. Russia is a strong opponent of the United States position as the unipolar hegemon. Instead, one seeks to promote a multipolar world order, with Russia as key actor. The power demonstrations of recent years show that it is fruitful to See Russian politics in a realism perspective, where power is strong and strongest do what it takes to ensure their own influence. A security policy crisis at Svalbard is a risk at risk escalation and ultimately armed conflict. Due to disagreement among treaty countries on the exercise of authority, Norway may have to deal with situation without allied support. Any Norwegian change in presence and action in the northern areas near the Russian Navy's main base will had to be guarded with argus eyes. Potential for misunderstandings and For defensive action to be perceived as offensive and escalating, is definitely present. The importance of maintaining a Norwegian modern seagoing force that is capable of enforcing Norwegian jurisdiction and territorial integrity, therefore
gained momentum and importance. To define a scenario that emerges the Russian relationship The North Fleet and Norway have focused on the Svalbard region in 2030.
Chapter 2 Scenario 2030:
The battle for Svalbard

This chapter follows the description of the scenario that originates for the further study and will be answered in response to the two-part issue:

a) What is the Navy's contribution and role in a security crisis and armed conflict in the High North?

b) What capacity and capacity gap exists in the Navy in relation to threat picture in the High North?

Security policy backdrop anno 2030

The year is 2030. Russia has years since the annexation of the Crimean Peninsula spring 2014 has become increasingly power-oriented in its foreign policy. Russian Politics and rhetoric are characterized by the word vlast (power), and Russia is mentioned in the world press as "power people". The reason is an increasingly expansive politics, with constant violations of democratic values and rules of the game. Russia's repeated violations of UN decisions concerning the superpower Conflict vis-à-vis Russian border states has led Europe into a state there The individual countries have ever less faith in the UN's power and authority as supreme premier. Atomic powers use the so-called «stability / instability paradigm to promote its own goals. This gives the great powers one larger conventional action room, without interference from other atomic powers. The fear of defense with nuclear weapons creates the foundation for strategic stability between the great powers, just like during the Cold War. The Russian weapon program GPV-2020 has finally been completed. delays as a result of economic setbacks after the Ukraine crisis in 2015, and a period with low oil prices, was gradually recovered in the period up to 2020. This contributed to a Russia with a strong economy, despite major internal turmoil. The The last goals for the GPV program were reached in 2028. Russia is now one of them most modern military nations in Europe, as well as being the largest. Russia's political elite is characterized by internal struggles with the oligarchs in tip. The prevailing putinism in the population is under pressure as a result of tougher living conditions for the ordinary Russians. Negative population growth, coupled with increasing nationalism and xenophobia in the people, has become one stability threat. In order to hold on to the population's support, President has led one ever more expansive foreign policy. Expansionism as a unified strategy is used as a solution to avoid loss of face within the nation. Restoration of a Great Russia consisting of the former Soviet states, whose loss during Mikhail Gorbachev in 1991 was nothing short of a scandal, has ridden Putin's political agenda throughout his third term of office.
The Baltic States - a central European crisis

The Baltic countries and former Soviet republics Estonia, Latvia and Lithuania has long had a fearsome relationship with Russia, especially since the Russian annexation of the Crimea and the invasion of East Ukraine in 2014. It is feared that Russia, with a view to protecting Russian minorities, must lead one hybrid war in the Baltics, which results in annexation and incorporation in Stor-Russia. The Baltic countries membership in NATO, which was supposed to have one deterrent effect on Russian intervention and influence seems to have had small effect. At the same time, they have the downsizing of the European NATO countries of the defense through decades after the Cold War set its tracks. After As the Russians implemented parts of their large-scale weapons program, several of the Northern European countries realized that it was time to reverse the trend with dismantling. Modernization is therefore on the military side in large parts of Northern Europe, but the process is costly and time consuming. Recently, Putin has ordered several major exercises in the Western Military District. Russia has deployed several new missile systems along the border with Europe, including the new and modernized Iskander R-500 missile (Military-Today).com, 2015. With a ballistic range of more than 1000 km and ability to To bear tactical nuclear warheads has the missile ability to reach far into it Eastern European zone against Russia without crossing borders. Further has the Russian defense increased its presence in Kaliningrad. Naval base By the Baltic Sea there is a mainland corridor to Russia, something the authorities long have declared dissatisfied with. At the same time, Putin is widely dissatisfied with what he calls a Western barrier to Russia's sphere of interest. The Baltic States fear of one Russian intake, especially in Lithuania, has led to repeated requests for assistance from NATO to balance what is perceived as Russian aggression. The thing is also presented to the UN Security Council, where Russia has vetoed military interference from the west. The Baltic countries feel so unmatched, military as inferior as they are that they, in line with NATO’s Article 4, have asked the alliance on consultations on the challenges with Russia. So far have The consultations did not bring forward, although different economic sanctions are implemented. At the same time, Russia, as a symbol of its strategic strength, and as one signs of dissatisfaction with NATO’s consultations, launched a series of maritime actions in the Baltic Sea. Baltic vessels are rejected, and fishermen refused to carry out its work. Russia has also threatened to deploy Iskander batteries in Kaliningrad, something that is not welcome to the West. Sweden reports increasingly frequent Russian flights across the Baltic Sea, with cross-border crimes of the airspace airspace, and a squadron with Su-35 Fullback fighter plane shell 32 have been transferred to the military base in Kaliningrad. The new fighter plane Pak-FA is also reported observed over the Baltic Sea. The Russian escalation has resulted in NATO having decided to increase its presence in the Baltic Sea areas with a greater fleet strength. IN In
addition, NATO has stepped up its patrol and presence in the airspace across the Baltic Sea with the triton hillside monitoring system and fighter plane of Type F-35. The fleet strength in the Baltic Sea consists of vessels from Germany, France, The Netherlands, Spain, the United Kingdom, Denmark, Norway and the cooperative nations Sweden and Finland. Poland and the Baltic countries have all increased their coastal preparedness, but awaits the situation and assistance from NATO. Both Germany, France and The United Kingdom has given the highest priority in order to ward off the crisis that is in question.

Military escalation in the High North

In parallel with the latest developments in the Baltics, a large one has begun naval exercise in the High North, which comes in addition to Russia's annual autumn exercises. Western intelligence claims that this may be a pretext for a deployment of the Russian bastion defense in the north, which may indicate that the North Fleet is in standby. The exercise on the Kolahalvøya includes according to state media closer to 40,000 soldiers, 41 warships, 15 submarines and 110 aircraft. The Russian Defense Minister stated in a press release that the goal is to test the readiness of Russian forces. The last week there have been several sensational advances from Russia Deputy Prime Minister on Norway's jurisdiction over Svalbard. Among other things has he withdrawn Article 9 of the Svalbard Treaty, which prohibits the creation of bases or facilities that can be "used for war purposes". Russia is threatening to deploy missile batteries on the archipelago to secure their own supply lines Nordflåten and the bastion defense's freedom of maneuver. This last promotion In the series of challenging statements and pressures has created a lasting excuse mood between Norway and Russia. It is reported about Russian warships 33 33 from the Northern Fleet that has begun to banish fishing vessels in the fisheries protection zone 5 around Svalbard, and the Norwegian Coast Guard feel uncomfortable in their police role in the north. The Coast Guard has on several occasions been exposed to threats when They have tried to shield the Norwegian fishing vessels and maintain their fisheries inspections in the fishing zone. The new development is referred to as a security policy crisis for Norway, something which is openly acknowledged by the Norwegian prime minister. Several threatening episodes has taken place as a result of actions from the three new nuclear-powered Russian Destruction of the Leader class, which is both conventional and unconventional weapons. After modernization, Russia has equipped all their ocean platforms with long-range cross-missiles and Kalibr series seismic missiles (3M-14 and 3M-54) and P-800 Oniks (Kopp, 2012). With their range and impact, these missiles are an effective one denial strategy in large areas. However, a vessel strength is also from Nordflåten observed with courses for the Svalbard region consisting of two new ones amphibian ship of the Mistral class, two frigates of the Admiral Gosckov class and a modernized crossing of the Slava class. Whether the force is also involved A Jasen-class attack boat, is
uncertain, but highly likely. It is reported also from the Intelligence Service that a crossing of the Kirov class is getting ready for departure from the northern fleet's main base along with the "Admiral" carrier Kuznetsov. The Norwegian Governor of Svalbard reports unusually high activity in Barentsburg, which is the subject of a large intake of "researchers" with athleticism look. He also reports on a large loading vessel that has arrived a number of forty-two foot containers on board. These have been shipped to different places on Svalbard and it is unclear what they contain. However, they are kept under constant attention of Russian personnel. This emphasizes Western intelligence reports suspected of a possible deployment of the bastion defense, leading to an extensive crisis meeting in the government's crisis council. Parallel with Norway making the crisis for NATO under Article 4, decides The defense to send a national military naval force north to mark Norwegian interests. At the same time, the Air Force is put on standby and ordered 5 The Fisheries Zone is a zone of 200 nautical miles around Svalbard established by royal resolution in 1977, for the conservation of living resources in the sea and the regulation of fishing and catching.

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Evenes, both to take care of them maritime units and to create better responsiveness for cutting-edge purposes. The maritime force Norway decides to send to Svalbard is the Norwegian Task Group (NorTG), which consists of the entire operational military vessel structure. NorTG therefore includes all operating vessels, except a frigate of Nansen-class and a new Log class of the Fram class. These ships are sent to The Baltics as part of NATO's calm in the Baltic Sea. In summary, Scenario 2030 is based on Russia's intention to take seriously of the plan to rebuild a Greater Russia. Russian authorities initiates preparatory military measures both in the Baltic Sea and at Svalbard in the north. Norway is under pressure as a part of the rollout of the Russian bastion defense, with the capabilities this implies after modernization and because of Svalbard's strategic importance. A security crisis in The borderland of armed conflict has evolved, and Norway has chosen to send The navy north as a response to Russian power use in the fishermen's zone.

Reactions: The role of the Navy in 2030

What is the Navy's contribution and role in a thoughtful security crisis and armed conflict in the High North? To answer this question, see in In relation to the scenario described, I will take over the capacities that Predicted to the Navy - both today and the way they are expected to be in 2030 - as well as some community capabilities in the Armed Forces. Then I will see the importance of the various capacities against the military command and command functions control, firepower, mobility, protection, intelligence and logistics. This applies both Norwegian and Russian capacities. Since the mid-1990s, the Norwegian defense has been the subject of it biggest reorganization in its history. Our entire defense structure has more or less replaced by new material, and the weapons branch The furthest in reorganization and renewal can be said to be the Navy. This has political
and military leadership expressed through statements that "Norway has one of Europe's most modern Navys." 6 In the described scenario for this study, it is focused on NorTG as actor when the Norwegian Navy is mentioned. We are going to elaborate on this force a tactical management element and predicted capabilities as we assume it will be in 2030. It is assumed that the Defense's budget situation has changed, so that the assigned frames match the structure and the tasks The Armed Forces are set to solve. At the NATO summit in Wales 2014, the heads of state became agree on a defense budget of at least 2 per cent of GDP within one 10-year period (North Atlantic Council, Wales Summit Declaration, 2014, Item. 14). This framework is foreseen for the Norwegian defense of 2030. In other words, a changed security policy picture has led to for the Armed Forces to have a structure that is sustainable and credible enough to constitute a military threshold. Among the nine core tasks of the Armed Forces is the first and most important "to be one war prevention threshold based on NATO membership '(Armed Forces, 2014, p. 10). Furthermore, it is said that the purpose of a military threshold is to obtain a potential aggressor to refrain from pushing, threatening or attacking Norway because the cost will be too high. A prerequisite for which That this cost should be big enough is that the deterrence must be real and trustworthy. Very many Western countries, including Norway, are in the future Soviet Union resolution significantly reduced the volume of its defense. Admittedly, technology and advanced equipment have made military equipment more efficiently and precisely, but the nations have reduced their structures to a level where the loss of individual units will be fatal. Today, Norway has a navy of 23 vessels, both new and advanced, but still in a very limited volume. Unlike the culmination period during the Cold War, when the Navy consisted of more than three times as many vessels, today's structure is considerably more vulnerable. An acknowledgment from the chief of defense and the defense minister in 2015 is that Norway has left the structure too far down (Bruun-Hanssen, 2015; Søreide, 2015). A prerequisite for NorTG in 2030 is why it is taken to reverse this trend. 6 See for example. Commander Captain Bjørn-Ove Stikholmen's statement (Dalløkken, 2015).

What are the Navy capacities in 2030?

One main point in the scenario is to compare by the Norwegian and the Russian capacities. These are therefore modernized somewhat in relation to today's level, such that the analysis takes over the technological development. The development of New military equipment takes a long time and technology to be useful in 2030 must be available or on the drawing board in 2015. The following available Capacities are foreseen for NorTG in 2030:

- 5 frigates of the modernized Nansen class.
- 6 new submarines of the Neptune class based on AIP propulsion 7.
• 6 Skjold class corvettes with improved fuel capacity.
• 2 front-class logistics vessels
• Autonomous Hugin systems for mining and mining sweeps that can be transported by car, plane or vessel. Existing miners were abolished in 2018, when a parent vessel for independent mining operations was decided acquired. The vessel acts as a forward operating base for them autonomous subsea systems and has the ability to convey data to the rest of the strength and to the operational headquarters.
• Unmanned surface vessels for patrol and submarine hunting. The vessels are small enough to be worn as part of the frigate system.

The Navy's tactical dronesam, an established group deploying with vessel strength and operates unmanned systems. Norway has acquired tactical systems in the Navy to achieve better sensory coverage, camera recognition, high speed communication, electronic warfare and AIS 8.

The scenario assumes that the entire structure is available. Furthermore, it is added As previously mentioned, a logistics vessel of the Fram class as well as a Frigate has been sent to the Baltic States to assist NATO in dealing with that situation

Air Independent Propulsion (AIP) is a technology that allows diesel-powered submarines to escape to go to the surface or use snorkel to gain access to oxygen. Progress can thus take place over longer periods underwater and the danger of being detected by surface vessels or aircraft being less. AIS (Automatic Information System) is a vessel system like all maritime units over one certain size may have. The system gives other seagoing vessels information about the vessel. Also Other military devices must have this, but they are not required to send information. 37 37 which is about to play there. This means that 4 frigates, 6 corvettes, 6 submarines, 1 logistics vessel and some smaller items are available in Norway. In the following, I will describe the single elements with their most important contribution to show what these can accomplish in the operation theater, which forms the basis for a comparison of the strength of the counterparty. Hugin system for mine hunting will not be dealt with further, as this is not heavily weighted in the scenario.

**Nansen Class**

The Nansen class combat system consists of a frigate with a helicopter of the type NH-90. Data for Nansen-class frigate Notes displacement 5200 tons fully loaded Length 134 m Width 16.8 m draft 7.6 m progress 2 × BAZAN BRAVO 12V 4.5 MW diesel engines 1 × GE LM2500 21.5 MW gas turbine The diesel engines are intended for economic operation and for conditions where Low consumption of bunkers is important. The gas turbine is intended Use where speed is important, such as at high threat. Speed 26+ button Range 4500 nm at 16 knots Lamps 2 x Mk 41 VLS 1 (for missiles) 2 strike modules of 8 cells each. The modules can carry
one range of different types of missiles like Tomahawk, ESSM, SM and JSM (if the manufacturer gets buyers with a wish for one VLS variant) Air protection: 24 x ESSM BI II SAM 2, 10 x SM-2 BI IV In the scenario it is assumed that the Nansen class has been received air protection with a mix of ESSM Block II (shell to be completed by 2026 3) and standard missiles (SM-2 Block IV). ESSM comes in quadpacks, i.e., there is room to 4 missiles in each VLS cell. 38 Surface Filters: 8 x NSM Possibility of carrying vertical Kalut shot JSM in VLS. Kongsberggruppen has designed JSM to fit in Mk 41 VLS in addition to fit inside the F-35 våpenrom. So far, there has been only political acceptance for defensive weapons in Norway, but developments in the scenario have shown the importance of having cross missiles like Tomahawk in portfolio. Artillery: 1 x 127 mm OTO Melara cannon 4 x 12.7 mm Browning M2HB- machine guns. 4 x Sea Protector (stabilized weapon station with optics and Possibility to carry 12.7 mm machine gun) 1 x CIWS 4, 30 mm Gatling 127 mm cannon is decided to be purchased to participate the development of various ammunition types present in This caliber, including GPS-controlled ammunition. 12.7 mm mitral lenses are primarily designed to take care about smaller surface units and guarding along the quayside.

CIWS is an automated self-defense system that is designed to take out incoming threats in the last shot, typically within normal self-defense missiles Engagement distance. Underwater weapons: 4 x 324 mm torpedo tube for Sting-Ray torpedos. Synkeminer for delivery by helicopter. Sensors AN / SPY-1F (air / surface) radar Passive phased array radar, in the scenario upgraded with effect, resolution and range to be a contributor in Ballistic Missile Defense (BMD). CAPTAS MK II V1 active / passive rope sonar Sonar for detection of submarines and torpedoes. MRS 2000 hull-mounted sonar sonar for detection of submarines and torpedoes. Complementary Mental sonaries give the vessel the ability to operate in different bed in the sea. Command and control Link 11 and 22 Link 16 Satcom Task Group High Speed Link In the scenario, the Nansen class is expected to be upgraded with Possibility of tactical high speed link between devices to sea, either directly or via UAS. Helicopter NH-90 with possibility of carrying torpedoes or NSM. Equipped with Flash Dipping- sonar and electronic warfare equipment. The helicopter is of medium size and has a stamina. The sum gives it good performance in maritime operations. UAS Unmanned tactical aircraft which can ease from launch- slack on board and bring along different types of sensors. The sensors can carry: Optics for day and night as well infrared (IR) or Synthetic Aperture Radar (SAR). In addition can it be equipped as a communication- srelé or AIS - transponder. In the highlands this can get very well with then the military infrastructure is worse than otherwise. 1 VLS (Vertical Launching System), Vertical launch missile module. 2 SAM (Surface to Air Missile) - missile suitable for shooting down incoming air threats. 3 Upgrading of the Nansen class air defense has been promoted by the government in a press release (Government Solberg, 2014a). 4 CIWS - Close-in weapon system
Fram-class 9

Data for KNM «Maud» logistics vessels Notes displacement Approx. 20,000 t Length 180 m Width 26 m draft ? progress Speed 25 buttons Estimated values based on corresponding vessels Range globally Lamps Mitral loops for guard and self-protection against smaller surface units No missile systems or other weapon systems more estimated. The vessel therefore requires protection in its operating area. Fly Space for 2 x NH-90 hospital Capacity Operation room and full hospital capability load Capacity Bunkers 8000 tons Containers: 30 pcs. standard size These numbers are approximate, based on the ship size.

Corvettes of the Skjold class

Data for the Skjold class Notes displacement 273 tonnes Length 47.5 m Width 13.5 m draft 2.5 m (without lift) 0.8 m (with lift) progress 2 × 2000 kW P & W gas turbine 2 × 4000 kW P & W gas turbine The turbines operate 2 watercourses. Speed 60+ button Range 1200 Nm in 42 kn A prerequisite for the scenario is that the fuel capacity has increased by 50% from today's reach of 800 nm. 9 The front class is currently under construction and is expected to be completed by 2016. 40 Lamps 8 × NSM 1 × OTO Melara 76mm Super Rapid cannon Mistrall air defense missiles (short distance 6 km) 2 x 12.7mm mitral loops MASS-decoy For the scenario, it is assumed that the Skjold class has been received air defense in the form of ESSM Bl II that can be placed in a selection of the NSM wells aft on the vessel. The number will be one horse trade between being able to deliver surface missiles and being able to take care of themselves or others. MASS is a rotary launching system with countermeasures designed to mislead incoming missiles in terminal phase. Sensors Thales MRR-3D NG (air / surface) High performance rotary radar. Command and control Link 11 (22) Link 16 Link 22, which is a more modern version of link 11, is expected to be implemented in 2030, which gives the vessels considerably better prerequisites for exchanging data between.

New submarines of the Neptune class

Data for the Neptune class (modeled after the German 212a class) Notes displacement 1450 tonnes (surface) 1830 tonnes (immersed) Length 55.9 m Width 7 m draft 6 m progress Diesel-electric and AIP AIP fuel cell propulsion is used when necessary To operate hidden for a long time, without going to the surface. Speed 20 knots (immersed) Range 8000 nm at 8 kn Lamps 6 x 533 mm torpedo tubes Carrier of heavy anti-surface pumps, MIDAS anti-air- shooting and Tomahawk cross missiles. Space for a total of 14 torpedoes / missiles. Sensors Flank array and active / passive towed array sonar. Command and control Link 11 (22) and Link 16. The submarine is capable of communication with the strength of all ways. It is in the submarine's nature to behave hidden, ergo it will be the net recipient of information. 41
Unmanned surface vessels (patrol and submarine hunting)

Data for unmanned surface patterns Notes displacement 6 t Length 11 m Width 3.5 m draft 1.2 m progress 2 x Marine diesel 475 hp. Fuel capacity 1000 l. Speed 50 knots Range 300 Nm at 45 kn + 10t in area. Lamps Gyrostabilized weapon platform tform that can carry weapons after selection. Possible weapon types: Mitral seed 12.7mm-30mm Hellfire missiles Gathing gun - 20mm. Sensors Camera SAR radar ESM / ECM ELINT / COMINT Flash dipping sonar of the same type as the NH-90 does vessels will be able to contribute actively in submarine hunting. Command and control Satcom and link to motherboard tform which will be either Nansen or Fram class. The vessels can be operated from installations on board, con- tainer-based installations on land, and possibly from aircraft.

Air Force contribution

A scenario at Svalbard is hard to behave without the involvement of Air Force's new F-35 fighter plane. Therefore, in the scenario, 52 aircraft are expected to be acquired, of which 48 are in Norway. The table below shows the most important capacities as required for F-35A (Global security.org, 2015):

Data for F-35A Lightning II Notes Weight Empty plane: 9980 kg Fully loaded: 22 680 kg Drivstoffkapa cytotoxicity 18,500 pounds internally Length 15.4 m Wingspan 10.7 m Height 4.6 m design 5th generation stealth plane 42 42 progress 1 x Pratt & Whitney F-135 Speed Mach 1.5 - 1.8+ The aircraft has excellent flexibility and maneuverability. Range Kampradius (internal off)> 590 nm / 1.093 km Total (internal fuel) ~ 1,200 nm / 2222 km Lamps JSM (2 internal + 4 external) Tomahawk (4 pcs externally) JDAM (2 pieces internally and opportunity for external) Laser-controlled bombs (internal and externally) Air-to-air missiles (internal and externally) JSM towards sea and land targets. Tomahawk is expected to be carried on F-35 in the scenario. With full load, the aircraft could carry 4 pieces. external to strike- assignment. For the number of weapons of other types, refer to Global security.org 1 . Sensors AN / APG-81 AESA Radar AN / AAQ-37 DAS (Distributed Aperture System) EOTS (Electro-Optical Targeting System) AESA (Active Electronically Search Array). Multi-function radar controlled electronically without rotating parts. DAS is an integrated sensor system for improved situational understanding of the pilot, as well as increased safety for the aircraft. The electro-optical target computer system allows the pilot to integrate information from multiple sources to achieve goal solution for engagement. Command and control Integrated sensors like collaborates in network to increase survival and situational awareness Link 16 capable For the scenario, it is assumed that the F-35 is seamlessly integrated in a network-based defense, where communication and outsourcing Exchange of data in the operating theater occurs unobstructed. Fly and vessels can exchange data and handle each other's weapons
in flight. For example, it may be Tomahawk, JSM or NSM. High-speed data link is used for this. 1 F-35 Specifications:


Following Norway's phasing out of Orion as its own intelligence, surveillance and anti-platform in 2022, has the unmanned air system Global Hawk has been used to cover some of its features. NATO's AGS- Ground monitoring systems have been increased to 10 MQ-4C since startup "Triton" and become a reliable and sought-after source for information retrieval. However, they do not have the capacity to drive submarine hunting or weapons delivery The Orion planes did. This capacity was supposed to be replaced by frigates helicopters, but it turns out that these do not cover the same footprint as an Orion. Politically, a work was started in 2025 to investigate the possibility for multilateral cooperation with the United Kingdom and the Netherlands on a joint procurement of maritime patrol aircraft. This work has carried fruits, and In 2028 it was decided to acquire a fleet of 12 P-8 maritime patrol aircraft. The delivery date for these is estimated at 2031, with four aircraft based in each of the partner countries. For Norway, this meant a continuation of Andøya as a flight base and preparation for this for four P-8 patrol flights.

Data for MQ-4C «Triton» * Notes Weight 14 630 kg Length 14.5 m Wingspan 39.9 m Height 4.6 m progress 1 × Rolls-Royce AE 3007 turbofan (Jet) Speed 330 knots (610 km / h) Range May be in the air for more than 24 hours at 55,000 feet (17,000 m) height. With a speed of 330 knots, the reach of one endurance of more than 24 hours almost insignificant. The distance traveled at this time may be more than 7920 nm (14 668 km), corresponding to 67% of the Earth's perimeter around the equator. Lamps No weapon Sensors AN / ZPY-3 Multi-Function Active Sensor (MFAS) In order to operate around the globe, the aircraft body is out-controlled with de-icing system and lightning protection. This does the unmanned plane is able to fly through the skylight to carry out detailed observations of objects. The sensor equipment implies the ability to detect, locate and classify goals, and follow them over time. Command and control Function as data integration relay improves the ability of a force to come munitions in challenging areas The Triton program is meant to give users real-time intelligence across a large area at sea and on land. At 55,000 feet, the sensors cover a monitor-area of 7,000,000 square kilometers. On one radar sweeping is covered 5200 square kilometers. * Data for MQ-4C Triton is derived mainly from Wikipedia (see "Northrup Grumman MQ-4C Triton"), which has a overall source overview for capacity.

Norway's 48 F-35 is in the scenario prepared for Ørland, with progress base on Evenes for aircraft operating in the Barents Sea. The flights have gotten in mission to protect the Norwegian maritime force and therefore in consultation with NorTG established a Combat Air Patrol (CAP) in the field of interest, with a patrol of two
planes. Each aircraft has the capacity to carry two patrols 4 hours per day, which, with one hour of transit time, each gives two hours of efficiency time with strength. To meet the need for continuous protection and at the same time being an effective military threshold in the High North, this leads to twelve Patrols per day must be completed, which binds 8 F-35 on Evenes. The ground-based planes are in the event of further reflection of the situation readiness for early expression. As flight over time involves maintenance, a total of 12 aircraft are being launched at Evenes.

A rotation order to hold one Patrol continuously over the force with overlap is shown in the table below. Fly 24 hours divided into hours

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Since the planes have a short reaction time and carry both Tomahawk and JSM missiles, they will contribute to a significant military threshold in the north. If so Assume that each patrol is equipped with 4 Tomahawk and 6 JSM, as well to air-to-air missiles for self-defense, this will provide a significant contribution of weapon capacity in the theater. Norway's total number of aircraft indicates 4-5 simultaneous 24-hour patrol, each consisting of two planes, is possible. On it On the other hand, a limited number of flight bases will pose a vulnerability, since it may be assumed that an opponent in the early stages of a crisis or war will prioritize removal opponent's ability to conduct flights. Since Norway has introduced a base structure where almost all resources are gathered in one place, or maybe two, this can be seen as a weakness an opponent will exploit. Norway does not have its own capacities for the supply of fuel in the air, something which make the aircraft dependent on their own bases or possibly allied capabilities for airborne after-supply.

**What capacities does Russia's northern fleet have in 2030?**

The Northern Fleet undergoes extensive modernization (2015) along with the rest of the Russian military forces. General considerations Whether status in the Russian maritime forces can be anything about what can expected of capabilities and capacities in the future. This may form The basis for showing capacities the Russians want in a potential conflict in northern areas around 2030.
Russia's modernization program, GPV-2020

The northern fleet was significantly reduced after the fall of the Soviet Union. This weakening was to some extent coincident with the overall reduction in others European countries after the Cold War. Despite a drastic reduction in number of units, there is now extensive modernization. Several of the devices which in recent years has been defective to the dock, is in the process of being established, and new units are under construction. Russian exercise activity has shown significant maintenance shortages in recent years, which has resulted in a Material availability of less than 55 percent for Navy and Air Force and less than 65 percent for Army (IISS, 2015, p. 159). The biggest challenge for the ambitious modernization program GPV 2020, which indicates a material renewal rate of 70 percent by 2020 and has a budget of about 3500 billion Norwegian kroner is the industry ability to deliver 11. In addition, factors such as a weaker oil price and one weak ruble. The weapons program is already in arrears. It's going to be great upgrades and newbuildings. After Russia's invasion of the Crimea, the West has imposed sanctions, which has led to four new French-built landing vessels The Mistral class has been put on hold. Two of the Mistral vessels must be built license in Russia. Whether the sanctions can stop the construction of these are uncertain. In the scenario for 2030 a capacity in the form of two such ships is included. These can form a formidable capacity in terms of ability to get a foothold in one theater on land. Another challenge for the Russian armor program 10 Data is derived from various think tanks such as IISS, CSIS and IHS-Janes. In addition, various inter-Web sites that specialize in defense materials used, such as Fas.org, Globalsecurity.org and to a certain extent Wikipedia. Data is as triangular as possible to minimize error sources. 11 Katarzyna Zysk also writes about the underlying causes of this in the article "Russia` s Naval Ambitions »(Zysk, 2012). See also Zysk, 2015. 46 46 is Ukraine's decision to ban all military cooperation with Russia. Ukraine has been an important supplier of helicopters and aircraft engines, as well vessels and maintenance of heavy intercontinental missiles. The Navy's share of GPV 2020 represents about 25 percent of the total modernization investment (Hakvåg et al., 2012, p. 37). This implies a formidable amount of billion to newly acquired vessels. Most importantly The medium term is the nuclear submarines. This indicates a big boost for the North Fleet, then Most of the submarines are based there. It is particularly important for two projects: The construction of 8 Borej-class submarines, equipped with the much-featured ballistic Bulava missile SS-NX-32 12 (Zak, 2014), and the construction of 7 Jasen class attack boats equipped with cross missiles. Russia is also planning Several specialty boats whose role is unclear, including project 210 Losjarik and project 09 851 Khabarovsk, which is solely to be occupied by officers. The effort on submarines shows that the nuclear tribe remains central in Russian power policy, and that non-resale capacity in the form of strategic submarines in no way has lost
its timeliness. Betting on attack boats with cross missiles and specialty boats likely
to carry out underwater operations the seabed and the like suggest that the
conventional muscles also strengthened. The ability to set goals with surgical
precision may be well effective as the use of nuclear weapons in view of deterrence,
but without The same danger of destruction and self-destruction as nuclear
weapons cause. 12 SS-NX-32 is the NATO name of the Bulava missile. Some US
sources use SS-NX-30.

**Northern Fleet anno 2015**

Vessel Type Number Category submarines 33 9 strategic SSBN 7 , one of which
is to be transferred to the Pacific fleet 24 tactical, of which 4 SSGN, 13 SSN and 7
SSK Larger surface vessels 11 1 CV cargo ship 2 CGHMN, of which a non-
operational Kirov class 1 CGMN for repair (Slava class) 7 DDGHM, 5 Udaloj I, 1
Udaloj II, 1 Sovremennyj Patrol and coastal vessels 9 3 FSGM 8 Nanutsjka Class
6 FSM 9 of Grisja classes My War Ship 12 1 MHO Gorja Class for repair 3 MSO
Natja class 8 MSC Sonja Class amphibious vehicle 4 4 LST Landgangsfartøy 7
SSBN - Sub Surface Ballistic Nuclear. For further abbreviations, refer to your own
list at the back of the study. 8 FSGM - Guided Missile Corvette 9 FSG - Missile
Corvette air forces Type Number Category Fighter 18 Su-33 Flanks D 5 Su-25UTG
Frogfoot 2 squadrons bombers 13 Tu-142M / MR Bear F / J Strategic bomber
Electronic warfare 2 Il-20RT Coot A 1 Il-20RT Coot B patrol 14th-38th May
Maritime patrol aircraft Måladatafly 8 an-26 curl 1 Tu-134 Trout transport and target
data traffic Helicopter Ka-27 Helix A Anti-jet helicopter, operates from surface
vessels Helicopter Ka-29 Helix B Mi-8 Hip Måldatarapportering Navy Infantry
Type Number Note Mechanized maneuver 1 MR Brigade 1 MR Brigade During
work-up 1 Marine Infantry Warrior 1 Marine Infantry Regiment Coastal artillery
and missile troops 1 ASjM brigade Freestanding missile brigades operating mis-
the defense of various areas. 48 48 In addition to the above forces, the Northern
Fleet can benefit from other forces in the Western military district under the
headquarters of St. Petersburg. This includes missile brigades, mechanized
brigades and special soldiers in shape by Spetsnaz. In other words, there are
significant forces at its disposal for the North Fleet. As far as offensive
conventional capabilities are concerned, there is much to suggest that considerable
effort is being made in the acquisition of the tactical Ice Skander-M missile to the
Russian missile brigades. This missile is the land-based version of the sea-based
Kalibr system, which is referred to in the export version of Club. These
characterized by relatively long range (400-500 km) and high precision. The
missiles can also carry tactical nuclear warheads, and a version of the missile called
Iskander R-500 should be able to reach as far as 1000 km in ballistic course. A
landmark version of the Kalibr system (3M-14) has reached 2500 km. This
combination of range and precision can contribute to significant challenges in
future conflicts, as the range indicates that the missiles can reach far into enemy
territory without the launching platforms needing to cross national borders. Deployment of such a capacity on Svalbard can have major consequences for free shipping at sea in the High North. The conventional and partly unconventional threat this entails will be great. Another significant effort is taking place in UAV technology, which has so far been in short supply. There are about 500 operational systems in the country forces and airborne forces in 2015, but these are smaller reconnaissance systems without weapon capacity. However, development work takes place around three unmanned platforms with takeoff weights of 1 ton, 5 tonnes and 1 respectively 20 tons, staged by the Air Force's leadership. The UCAV project Tax, led by MIG, has been replaced by a new UCAV project delivered by Sukoi with MIG as subcontractor. The project includes a 20-ton UCAV, which is scheduled to fly from 2018, and which has equivalent weapon load to manned fighters. If this project succeeds, Russia's capacity for remote operations with low footprints increase, and the threshold for power usage can decrease further in theirs sphere of interest. The danger of loss of own human life decreases, while precision The UK Strategic Trends Program points to developments in unmanned systems as a driving force for significant change in the way in which future conflicts are pursued (Ministry of Defense, 2014, p. Xxii).

**Nordflåten anno 2030**

Most of the vessel fleet of the Northern Fleet is of older date and begins to become mature for renewal. In recent years it has taken place extensively upgrades on the weapon side. In the scenario for 2030, it is assumed that The capacity has been renewed under the GPV 2020 program and that it The remaining 30% of the structure consists of the best upgraded capacities from today. The northern fleet will therefore consist of a significant proportion of modernized capabilities, and the number of vessels will probably be no less than the number from 2015. Russian development in missile technology and various countermeasures against ever more advanced threats are the biggest challenge seen from a western one Navy perspective. New and modern anti-drug missiles still do it harder to enter areas where such missiles exist. Russia has a long time time had supersonic anti-missile missiles like Sunburn (SS-N-22) and Shipwreck (SS-N-19) on board its larger surface vessels. Newer P-800 missiles Oniks (SS-N-26 Yakhont in export version) and the infamous Kalibr series 14 will be acquired in an ever increasing number. They can be shot from submarine, surface vessels, land and airborne units, and a containerized 15 system is under development. Effective Range ranges from around 300 km to the Oniks missile to 440-2500 km for the national variants of the Kalibr system 16 . 14 Kalibr series from vessel is displayed in this video after 2
minutes and 12 seconds: <https://www.youtube.com/watch?v=owN8f3sdhFs> (set May 2015) 15 Caliber Container Missile System Video and Land-based Missile Batteries: <https://www.youtube.com/watch?v=nbJ2nZWc1BA> <https://www.youtube.com/watch?v=mbUf9bOcnM> <https://www.youtube.com/watch?v=drlreb9-fXQ> 16 The variation in range depends on whether it is a naval mission or a landslide as used. 50 50 The development of container-based solutions may seem daunting, as this potentially may mean that all vessels, lorries, trains and the like can be used like weapon carriers. Although the container system can be claimed to break the distinction principle, ie to distinguish it from civilian entities, it is nothing to suggest that a development in this direction be stopped. The introduction of this kind of capabilities in an operating theater such as Svalbard, the Barents Sea and the Norwegian Sea poses major challenges for a maritime force and for airborne devices, as well as air defense systems with an ever-increasing range procured. The new Russian S-500 17 air defense system will have a range about 600 km and is designed to take down intercontinental missiles. IN An antiluftrolle is the range given to 400 km (Missilethreat.com, 2013). The argument above is supported by Paul N. Schwartz, as in a report from the think tank CSIS reflects on how to meet the Russian missile threats (Schwartz, 2015). In addition, Russian doctrine suggests, as below The Cold War that attack against a surface strength is carried out with great salves of missiles from several directions. This indicates a saturation strategy that is intended to overcome even the best self-defense systems (ibid., p. 6). An actor like Fasting in a theater with this kind of advanced missile systems, want one Effective Anti Access / Area Denial Strategy (A 2 / AD), which makes it difficult other actors to enter the area. A2 involves a naval strategy in the form of long-range missile systems and other weapons that prevent or delaying an opponent's access to a theater. AD implies an inner perimeter where control or denial is established and an opponent will face high risk to enter the area (Air Sea Battle forfice, 2013, p. 2). Since the Second World War, the Americans have been dominant at sea. The has focused on access to the global public as a world god with free traffic for trade on the open sea. New Russian missile systems like Kalibr and Oniks, as well as the Chinese Carrier Killer missile, show that Advanced missile technology is becoming increasingly common. Norway is with its new NSM an example of this. Since Russia is very far ahead when it comes to anti-missile missiles and cross-missiles, it must be carried out increasingly advanced countermeasures on devices that will enter a future operating theater with Russian The 17 S-500 missile system is displayed in this video: <https://www.youtube.com/watch?v=txNOXivEwvQ> 51 51 forces. For Russia, the first and second defense line of the bastion defense could be represent an A2 / AD strategy. Another important technology trend is the American development of an electromagnetic powered cannon, called Railgun 18 . These have huge ranges compared with today's conventional artillery. A Railgun is characterized by it uses
electromagnetism to drive the projectiles out of the cannon, which involves a velocity of about seven times the velocity of the sound. With projectiles that have this speed, the range of artillery will be eventually reach 400 km, and the kinetic energy of the projectiles alone could cause great harm. Explosives in grenades can thus be done redundant if this is desirable and each shot becomes more cost effective. This type of cannon can also be used for self-defense when it comes with Different types of grenades will reach out to incoming threats faster than today self-defense missile systems. The speed means that flat area 19 is reached a distance corresponding to the radar horizon of a modern navy vessel, something which can dramatically change the number of threats a vessel can handle. If Americans have this system at the prototype stage today, it is likely that other superpowers also have access to this technology within 15 years, and that Railgun could be found on Russian units in 2030. Laser weapons as a defense system against the rising missile and air threat are high Priority in research among major military forces. German Reindeer Metal 20 launched a prototype in February 2015, and US NAVSEA has helped of the Raytheon Company industry company has long been a leader in this field technology. According to US statements, laser weapons should be installed on their destroyers who are undergoing upgrading from 2014. The US The LAWS 21 laser cabinet system , with its current configuration, is thought to be one defense system against smaller surface vessels and UAVs. However, the technology will further developed to be able to shoot down incoming missile threats and 18 Railgun appears in these videos: <https://www.youtube.com/watch?v=Ev0G49jXJX0> <https://www.youtube.com/watch?v=GXFO6aqjoJSc> 19 Flat Field: Expression describing the projectile's flight path as approximately straight-line to one given distance, before it will become more and more ballistic. 20 Video with the Rheinmetall weapon system: <https://www.youtube.com/watch?v=Mn6b2M1Dnc> 21 LAWS Video: <https://www.youtube.com/watch?v=DODbgJnu2wE> <https://www.youtube.com/watch?v=xACAP5ZJ0Gw> 52 fly. The advantage of using laser weapons is that it does not require neither grenades or missiles from the delivery platform to take out an incoming threat. Ergo will the number of threats that can be engaged, only be limited by the number laser systems, how long each individual threat must be illuminated with the laser to achieve the desired effect, as well as detection of the threat. Some Russian videos The internet also claims that Russia is researching this technology 22 . The two technologies mentioned here are groundbreaking in conventional warfare at sea. Since the Americans have the technology policy to be one more Two generations in front of other nations military, it is expected that more of them Major military nations will possess similar capabilities in 2030 23 . Russia is no exception in this way. In addition, it must be assumed that the missile technology has improved further and that a generation of cross-missiles with active countermeasures like jamming and decoysystems will be developed. Russia has high ambitions and seems to be able
to realize them (Hakvåg et al., 2012; IHS, 2015; IISS, 2015). The Russian northern fleet's offensive capacity can consist of the following in 2030: 1. 4 of 8 Borej Class SSBN Submarines with 16 Bulava SS-NX-32 Intercontinental nuclear missile as the main weapon. 2. 3 Delta IV Class SSBN, upgraded with 16 Bulava SS-NX-32. 3. 4 out of 8 Jasen-class SSN attacking boats (assumed distribution between Pacific Navy and Northern Fleet) with Kalibr cross missiles. 4. 2 Akula II class SSN with 4 x 533 mm torpedo tubes and 4 x 650 mm torpedo doors, as well as space for 40 missiles / torpedoes / mines internally. 5. 1 Sierra II Class SSN with 4 x 530 mm torpedo tubes and 4 x 650 mm torpedo doors, as well as space for 40 missiles / torpedoes / mines internally. 22 Russian laser weapons: <https://www.youtube.com/watch?v=6_bRbOe2NM8> 23 Technology trends are also highlighted in the British Department of Defense's Strategic Trends Program (Ministry of Defense, 2014, pp. 94-96). In addition, address the American Sub-Committee on Seapower and Projection forces the challenges of the future in the video (minute 10: 00-14: 29): https://www.youtube.com/watch?v=J2gU_nElhUY 53 53 6. 1 aircraft carrier: "Admiral Kuznetsov" upgraded to be able to carry newest type of Sukoi Su-35 and PAK-FA Russian fighters (24 flights in total) in addition to 17 attack helicopters. The missile-carrying aircraft carrier carries also 12 caliber anti-missile missiles and 192 anti-missile missiles. 7. 8 Admiral Goscov-Class frigates with Kalibr and / or Oniks missile system (2 x 8 cells available). Area air protection: 4 x Redut VLS with 8 x 9M100 or 9M96 missiles (same as on the S-400 system) with a range of 120 kilometers. IN In addition, the 2 Palash CIWS has 30 mm high-speed cannons and Tunguska missiles (Immortal Today.com, 2014). 8. 1 Kirov Class Cross (Pjotr Velikij), modernized to carry the latest missile systems of the Kalibr series and Oniks. The Kirov class was originally designed to defeat American hangar shipping groups and is very well-suited for the purpose of their 20 launch pipes for SSN-19 Shipwreck. In 2030 the scenario is the vessel modernized to carry the Kalibr and P-800 Oniks missile system. 9. 1 Slava class crosses, modernized with 16 Kalibr missiles. 10. 1 Udaloj II Class: RFS «Admiral Tsjabanenko» with 8 x Kalibr or P-800 Oniks. 11. 3 New Leaders Class 24 Destroyers With Nuclear Reactors As Power And both Railgun, LAWS laser weapons, 32 Kalibr and P-800 Oniks anti-missiles. Vessels have very good self-defense against incoming threats in all dimensions, with a layered defense of various systems including elongated antelope and ballistic missile defense of the S-500 type. 3 Helicopters for anti submarine warfare are carried organically. 12. 4 landing vessels of the Mistral class. 24 Leader Class Destruction Designers: <https://www.youtube.com/watch?v=ORVVK6OCr74> 54 54 This list of surface capacities deals with vessels in the form of submarines and surface platforms as most of these are mentioned in the scenario. What Regarding smaller vessels and support, there is also a renewal of capacities here. The number of units within this segment may be assumed to be around outlined in the 2015 table.
Russian air and special forces and missile brigades As mentioned, it is also widely available for the Northern Fleet.

Chapter 3 Consequences for Norway

Today's Norwegian vessel structure is technologically advanced, but consists of few units, especially in relation to the number during the culmination of the Cold War. It modernized Navy of 2030 is founded on the Navy of 2015, consisting of 23 manned vessels spread throughout the range of vessel types. technological Trends indicate that some unmanned platforms can replace parts of features of today's capabilities. This applies both to the air, to the surface and under water. The Hugin system for mine hunting and mapping of the seabed is an example of this type of technology. Acquired in a certain amount can this The capability is brought on a variety of platforms in the operating theater and thus making minkrigs vessels of the Oksøy and Alta class unnecessary. This Type of Trends has been taken into account in the composition of NorTG for 2030, as consists of a total of 20 manned vessels. Then there is also a separate mother vessel for Hugin operations (mining operations) included. Of new capacities are unmanned surface vessels and tactical unmanned air units taken in addition to the manned vessels. Both in the air and the water apply the so-called tree there, which is summarized in the expression «Dull, Dirty and Dangerous», when it comes to unmanned craft. "Dull" (dull) is because the craft can be in an area over time and monitor a situation. "Dirty" means that the vehicles do not have to take consideration for operating environment with chemical, radiological or biological warfare. "Dangerous" (dangerous) follows that the biggest risk is the loss of the vehicle, but no human risk. Unmanned platforms can therefore be used in a range of missions without putting the big and expensive staffed craft in play. Since the turn of the century, the United States Defense has grown ever more benefit from such craft, a trend that just seems to continue. By looking at the predicted structure against what is referred to as the military operation features, this may reveal the contribution of the Navy able to provide in an operating theater such as the High North and Svalbard. The Military operation features consist of six parameters, abbreviated KIMBEL: Command and Control, Fire Force, Mobility, Protection, Intelligence and Logistics 25. These features cover a reasonable exhaustive range of contributions for a military force and form the basis for further assessment of them capacities included in the scenario. To answer the problem, it will be It is also important to illustrate the consequences of the Northern Fleet's modernized capacities for Norway and partly for NATO.

Command and Control

The frigates are NorTG's command and control center on the sea. It's from here The conditions are facilitated for the execution of tactical command based on The updated situation image from tactical devices and the operating situation image from the national headquarters. Exchange of information in The power can take
place in several ways, with satellite being the most preferred. Different LINK network is used for the exchange of the situation image and updating it between the units in the force. LINK 16 and LINK 22, which eventually replaces it traditional LINK 11 system, is considered to be operational in the scenario's time frame. As the exchange of data in badly-managed waters can be one challenge, tactical, organic, unmanned airplanes have been introduced table. These can be equipped to act as a communication relay against land and internally in the strength thus ensuring fast and secure communication over large distances. One challenge is that such systems are vulnerable to firing and therefore must be used wisely. However, unmanned aerial vehicles are relatively cheap, and the strength can therefore bring a certain amount without taking noticeable space. 25 A more detailed description of these functions in a common operative context is given in Chapter 3, "Operational Functions", in the Booklet Overview of Joint Operations (Berli (ed.), 2012, pp. 73-116).

57 Regarding command and control interoperability, is anticipated that the Armed Forces in 2030 have introduced a unified and seamless system for network-based defense, which means that communication flows also between the various weapons. Today (2015) this is a challenge, then different system types do not talk together. Thus, the Defense loses the advantage of fast information exchange in many situations where devices from different branches operate in a joint theater (joint perspective). The northern fleet belongs, together with the Baltic Sea fleet, to Russia's western military district. New organization after various defense reforms has brought the Northern Fleet under a new arctic command. This suggests a more comprehensive military focus in north. Defense Minister Sergej Sjojgu announced that as a result of increased Russian ambitions in the Arctic, units would be posted along the entire Arctic circle by the end of 2014. However, this has been an ambition for Russia for several years, as evidenced by The Military Balance (IISS, 2015). Increased focus on training and exercise, as well as material replacement, has made Russian Strengths are able to react faster than before. This proved special during the annexation of the Crimea Peninsula in March 2014. Good infrastructure on land In the form of rail and road networks, as well as improved command and control, some are of the reasons for the improvement in responsiveness. The traditional idea of Long notice time is outdated to the time needed for controlled strength building from the western side. By 2030, Russian forces in the north are expected to have unified command and control with good redundancy. The arctic focus has given results in terms of a good one expanded infrastructure for communication and collaboration systems. Russia is a spacecraft nation with access to capacities in the space segment. This can speak for a quality solution that works seamlessly between the branches across of Russia and also beyond the borders of the country. With the Russian research On unmanned systems that also include autonomous fighter aircraft, are expected these to make a significant contribution to a comprehensive integrated command and control solution. For Norway's part, the consequence is that Russia is full of
Western interoperability and network integration. Western information superintendent- hence can be challenged. The downside for both parties will be The reliance on technology that is vulnerable to jamming, electromagnetic pulse and firing of space segments. Development of Norwegian infrastructure in the north, which is based on fixed installations and space-based solutions, can be the key to more redundant systems in a tense situation where traditional Communication channels can be challenged.

Firepower

By studying the fire power of the various units, it makes a big difference in volume between cold war structure and modern structure. On one side have ranges and precision on weapons taken quantum leap with new technology. On the other hand, it kills down to hard facts when two forces stand against each other. Parameters such as range of weapons and number of weapon platforms become important sizes. This makes the vulnerability of loss of single devices appears at a time when the redundancy at loss is small. The new Naval Strike Missile Navy Navy, 26 produced by Kongsberg- The group and developed in Norway, according to the manufacturer, is the world's only operational 5th generation naval mission. It has features like stealth, terrain tracking, tightness navigation, target recognition, programmable combat mode and choice of hit point as built-in functions, as well as a range across the board of 200 km (Kongsberg Defense Systems, 2014). Regarding the number of NSM in it Norwegian structure, the 4 frigates and 6 corvettes will be equipped with 8 missile each. This means that 80 NSM is available in the operating theater, 32 of the Nansen class and 48 of the Skjold class. The Skjold class is required a logistics device that enables it to operate in the area over time. 80 Passive missiles with infrared searching and a range well beyond their own vessel radar horizon makes the possibilities great for injuring an opponent. The weapon can contribute to a military threshold and seem deterrent. Nevertheless, one will Weapon-delivered weapons only function if purpose targets are good and accurate. This requires devices like airborne platforms, such as F-35 or helicopter. 26 JSM (Joint Strike Missile) is a further development of NSM made for use from airborne flat- shapes, and has somewhat longer range. Unmanned craft can also perform a target reporting function, and Similarly, satellites may be able to participate in this role in due course. On On the other hand, it may be difficult for some airborne devices to operate safe in an excited operation theater, which means getting good Target data at a sufficient distance can be a challenge. Submarines can also act as a reporting unit for missile engagement, but this will contradict towards the submarine’s rational, which is to operate hidden so as to turn off from the depths. One The trend may be that submarines are becoming increasingly important in several functions, as Technologically advanced missile systems make it increasingly difficult to operate on the surface. What can the Norwegian force accomplish with 80 NSM? The effect is that The missile reaches
the target and detonates when it is going to. To cope with this a modern vessel needs more impediments. Missile design and built-in Logic is central and we can talk about significant five main conditions or factors. First of all, the missile must get the most out of its sight to avoid being shot down in a phase where it is in transit and has not started their final maneuvers. Secondly, the missile must have accurate positioning and an applicant who finds or possibly recognizes the goal it will meet. This requires accurate instruments and positioning systems as well as an advanced logic in the applicant. Missiles can primarily belong to two main categories missile seekers, active or passive. An active missile seeker will send out signals for to detect a target as the missile approaches the planned hit point for so to home against returned energy. The downside is that the target can detect broadcast effect and get a notification that it is coming. Passive applicants can avail themselves of different types of detectors, such as infrared detector technology in the case of NSM, where the applicant, without sending out signals, is home to the energy transmitted based on the target. The advantage of passive missiles is that they can not be detected Background of transmitted energy, but must be seen by vessel sensors in order to shoot down. Thirdly, the missile must aim at the defense system of the goal in order to do harm or neutralize the target. Modern missiles do this through different ending maneuvers (terminal maneuvers) or attack strategies make it most difficult to shoot them down. Some missiles can use of stealth technology and the lowest possible height for the latest detection of target vessel sensors. Other missiles maneuver when they come inside target defensive zone, where it is expected that the target will use different systems to try to shoot it down. Combinations of these attack strategies are also possible. The ability of the target to handle incoming threats is based on Two types of systems: (1) Active shooting of the incoming threat and (2) Passive countermeasures that aim to fool the applicant to the incoming threat so that the target solution is broken. Technology development is rapid missile front and counterfront front. How advanced the applicant in a missile is, therefore has a lot to say about the likelihood of reaching the target without that countermeasures have had effect. Old missiles are easy to trick while last generation missiles (5th generation) are difficult to trick. Fourth, the speed of the missiles comes into play. It is distinguished between missiles that go with supersonic speed and missiles joining subsonic speed. The supersonic shorter down the target vessel's reaction time, but are larger and more dependent on active applicants to achieve detection of the target. Thus, they are supersonic generally easier to detect, though Technological advances make them even smaller for the target sensors. Easier However, detection still takes the missiles back on speed. It is researched on so-called hypersonic missiles that go more than five times the speed of the sound. In such a way terminal speed even the most advanced defense systems will have problems with his defense. A typical radar horizon for a modern navy vessel is around 20 nm. A threat of hypersonic speed detected by it passing the horizon at low altitude to a vessel, means that the target only has 22 seconds to
harm the threat. If reservations are made to the vessel's command and control system, as well as the countermeasure must reach the threat, the threat will be halfway before the vessel carries out countermeasures. By the neutralization of the threat will One could nevertheless assume that the vessel is hit by residual mass, due to the fact the enormous kinetic energy. Subsonic missiles provide the target, provided detection, relatively long reaction time relative to the supersonic. Therefore will Subsonic missiles are more often designed to be discovered as soon as possible, in addition to various forms of final maneuvers to make it easier for shooting. NSM belongs to the subsonic category. Fifthly, the actual explosive effect of the missile's combat mode comes. This determines how many missiles are required to put a vessel of a given size out of game. Video 27 of an NSM who hits a former Oslo class frigate can be used as an indication of the extent of the destruction and thus form the basis of calculation for the number of missiles that are required to do equivalent damage to other vessels (Sundlisæter, 2013). The Oslo class had one displacement of about 1800 tons, and the combat head on NSM has a size on 100 kg TNT equivalents according to the manufacturer's sales brochure. used This as a starting point, we find that an NSM inadmisses a military vessel at 1800 tonnes at hits. With the five treated factors for missiles, this could be the case a generic formula to calculate how many missiles are required to Unscathing (out of game) a vessel of a given size:

Number of missiles = (target displacement in tonnes / 1800 tonnes) x (100 kg / battle size size in kg TNT equivalents) x (probability of finding and reaching the target) x (factor for the goal's self-defense ability)

The probability of finding and reaching the target is set to 100%. To be able to Use the formula appropriately, someone is required simplification of self-defense. Modern naval vessels have air defense systems to shoot down incoming threats. How well these work varies with the age of the systems and the number of defense systems. Some vessels have a single system that for simplicity may be assumed to have 25% of capability incoming threats. To meet such a system, we have to shoot 25 percent more missiles in an ointment to make sure we reach through with the remaining ones. This also requires simultaneous hits with the rest of the ointment. Similarly, it can be imagined that a vessel with a more efficient system will be able to handle multiple at the same time incoming threats, typically a vessel with legal defense systems. For those Most modern naval vessels we must assume as much as 80-100 Percent of incoming threats can be shot down. Then the ointment must be twice as large to reach the correct number. To take this into consideration I have set the following table for self-defense multiplication factor: 27 NSM video: <http://www.tu.no/industri/2013/06/05/her-sprenger-forsvaret-fregatten-i-fillebit-is>
Table 1: Self-Defense Force Multiplication Factor

<table>
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<th>Målets evne til håndtering av samtidig innkommende trusler</th>
<th>Prosent av trusler som håndteres gjennom lagvis forsvar</th>
<th>Multiplikasjonsfaktor</th>
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<td>Liten</td>
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<tr>
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</tbody>
</table>

In the Norwegian structure there are no vessels with more than 8 missiles available for an ointment. Should the number required be higher than this, must several vessels cooperate. On the other hand, we must ask if it is not one Other weapons that should be considered if the number is greater than 8, for example torpedo from submarine. The surface fleet's surface strengths have a formidable available firepower, which is difficult not to say impossible to match for a small nation like Norway alone. First, 6 submarines of the Neptune class will bring heavily to the square. This is a capacity that can stay hidden and turn off from the depths when needed, with heavy torpedoes, cross missiles against land and surface targets, or against helicopter using MIDAS. The introduction of Tomahawk as capacity in the Norwegian Navy represents a significant threshold multiplier. This due to the missile's ability to assign assignment, long range and different types warheads. A missile that can engage targets over 2000 km range provides Norway a whole new capacity. The last versions of Tomahawk can also take out Maneuvering Goal at Sea (Raytheon, 2015). Considering that also frigates VLS is equipped to carry Tomahawk, this can raise the military The threshold is enough for the cost to be significant for a country to be found to deal with Norway. The conventional warhead in Tomahawk consists of 500 kg TNT equivalents. This is five times more than an NSM. If the submarines are the only carrier of Tomahawk, and the number is estimated at 10 missiles per vessel in addition to torpedoes, submarines will have the capacity to carry 60 cross missiles in the operation theater. With Its ability to take sea and land destinations at long distances will be this 63 63 a capacity to count on. The Nansen class also has an opportunity to equip parts of the VLS modules with such missiles. Not to be at the expense of area airworthiness capability will be a mix of different missile types to preferable. The four frigates in the operation theater can be configured in pairs. Two frigates can each be equipped
with 24 ESSM Block area air protection II and 10 standard missiles, while the other two can be equipped with self-defense and limited area air protection with 24 ESSM Block II and "strike" with 10 Tomahawk. Such a configuration would give the frigates in the theater 20 Tomahawk, which brings the totals up to 80 Tomahawk. The threshold this will implying an opponent is formidable in relation to the limited one range and impact NSM has against other than Navy targets. Of other firepower, the Nansen class holds air defense missiles of the type ESSM Block II and standard missiles (SM-2) for area air protection. These will be processed under the point of protection. If we use the generic missile formula to see how many NSMs are To neutralize a Nansen Class frigate, the calculation will look like this: (5200 tonnes / 1800 tonnes) x (100 kg / 100kg) x (100%) x (1.8 (good self-defense)) = 52/18 x 1.8 = 5.2 rounded up to 6 missiles. This gives a pointer on the number of missiles required to neutralize a vessel of a certain size, with the ability to protect themselves or others. The numbers are somewhat generic, but They provide a good indication of the strength ratio between different capacities.

Do we use the formula to show the number of missiles needed to neutralize Russian surface vessel, this shows what challenge Norway is in the worst cases may occur (Table 2). The table does not take into account vessels operating together or with other support for self-defense.

Table 2: Number of NSM or Tomahawk needed to neutralize a Russian vessel

<table>
<thead>
<tr>
<th>Vessel type</th>
<th>Displacement (tonnes)</th>
<th>Max load</th>
<th>Self-Defense capability</th>
<th>Number of NSM (100 kg TNT)</th>
<th>Number of Tomahawk (500 kg TNT)</th>
</tr>
</thead>
<tbody>
<tr>
<td>«Admiral Kuznetsov» (aircraft carrier)</td>
<td>61 380</td>
<td>Excellent</td>
<td>62</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Slava-class</td>
<td>12 500</td>
<td>Excellent</td>
<td>13</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Mistral-class</td>
<td>21 300</td>
<td>Small</td>
<td>15</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Kirov-class</td>
<td>26 500</td>
<td>Excellent</td>
<td>27</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Udaloj II class</td>
<td>7570</td>
<td>Excellent</td>
<td>8</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Admiral Gorskov-grade frigate</td>
<td>4500</td>
<td>Excellent</td>
<td>5</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Leader-class destroyer</td>
<td>12 000</td>
<td>Excellent</td>
<td>27</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>

The table has some weaknesses. It would follow from the logic that Tomahawk, like is an older missile, should be easier to detect and shoot down than newer ones. The modest number mainly due to the great war head is therefore probably too low. This is achieved by looking at the Admiral Gosckov class, as is advanced and capable of handling more incoming threats. Since NSM and Tomahawk are both
subsonic missiles, the big Tomahawk missile will probably discovered longer than a NSM, which has stealth properties, and thus give the vessel several occasions to engage the incoming threat. With multiple teams of defense systems, therefore, it is likely that the number of Tomahawk should be lay closer to the number of NSM in this case, ie five missiles. Similarly, will could be claimed for Udaloj II. What makes the biggest impact in the table is the size on the warhead, which is five times as big on the Tomahawk missile. In order to neutralize a leader class vessel with NSM, we look at the table at this will require four Norwegian navy vessels' NSM inventory at the same time hit the target. It goes without saying that it would be inappropriate to use such a tactic to neutralize a destroyer. However, one can imagine one combination solution consisting of Tomahawk and NSM. In such a case could one thinks that a Nansen class could use a saturation attack consisting of 6 Tomahawk, supplemented with an ointment of 8 NSM. When Tomahawk- The missiles would have a greater chance of being discovered, these would probably pave the way for NSM, which is more advanced. Furthermore, depending on the chosen strategy, it is thought that some of Tomahawk- The missiles would pass through the missile defense to the destroyer. On the other hand, the use of sensors for detection of targets on the surface will speak in Norwegian disfavor. If it is assumed that Russian airborne sensors - be it aircraft, unmanned platforms or space-based segments - observes and following Norwegian units, the range of Russian missile systems will surpass the Norwegian. Consequently, it is unlikely, other than by a surprise attack, that Norway would come to terms with such a strategy. The war-prevention The threshold of a Norwegian surface strength will be in a purely firepower perspective be furniture. On the other hand, the presence of military units which poses a potential threat if they are overlooked could be valuable. This due to the fact that a Russian aggression in the form of weaponry against Norwegian units will trigger NATO Article 5, which means that Russia and NATO are in war. In a such a case, the cost will be great for Russia, which can potentially start a third world war. The most plausible threshold and the danger of Russian surface vessels in the 2030 scenario can be a combination of surface strength and the Norwegian submarines of Neptune- class. These are equipped with heavy torpedoes and long-range Tomahawk cross-missiles, and can therefore be used to neutralize targets both on land and at sea. New modern missile defense systems like Railgun and ship-based Laser will not help against the underwater threat, as far as it appears the dimension that can still operate virtually freely in the operation theater. A prerequisite for this would be that the submarine is quiet, so it does not detected on the basis of noise. Likewise, fighter operations will be F-35 and different weapon types like bombs and JSM are considered a high threat to it Russian surface strength. On potential deployment of Kalibr missiles with air protection consisting of the S-500 (55R6M) Triumphator-M with a range of 600 km on Svalbard, the air domain will still be challenged in large parts operation theater. Large resources must then be used to address this threat before any
Norwegian aircraft can operate in the area. An introduction of Leader-The class in a number of 3 vessels can be considered as a threshold measure in Russian favor and make Norway dependent on allied help, if the situation is not resolved diplomatically. If the purpose of the Russian operations in the High North primarily is to secure the Northern Fleet's bastion defense, the Russian forces will spend a lot of resources to secure the bastion for its strategic submarines. These will constitute rational to put pressure on the other great powers, especially the United States, about the risk for the use of nuclear weapons. The submarines' strategic role will come in particular expressions if Americans are involved in Russian actions in the Baltic states and the Highlands. Anti-boat operations will be a high priority task for surface strengths. A lot of resources would go to hunt for foreign submarines in bastion. Consequently, it is unthinkable that the Norwegian submarines will remain safe in depth over time. In addition, surface capacities like the Nansen class, with its ability to hunt for submarines, do not be welcome contributions in the theater.

The danger is Hence great for NorTG's arrival at the theater to be challenged with power. With regard to other weapons capabilities, the Norwegian force possesses 4 frigates 5 inch cannon and 6 corvettes with 3 inch cannon. 5-inch guns involve a good range of GPS-controlled ammunition, which is suitable for providing fire support against land targets. The 3 inch canons represent faster fire, but a more limited footprint. The canons can be used for gunboat diplomacy or deterrence at sea, but it requires that vessels from different sides lie and observe each other without the fire being loosened in advance. If fire is loosened, probably the guns will never come to shake, then other weapons with longer range will be used earlier. Use of artillery at sea is best suited to Engagement of goals that are big or stagnant, besides on tight team in self-defense and unexpected fights.

**Mobility**

Effective and fast relocation to and within the operation theater is crucial to establish an effective threshold. With the minimum notification times as possible. The presence and ability of rapid relocation is expected to be a multiplier of multiplication in itself. Preparation times for material in weeks and months are no longer relevant. In order for the forces to be mobile, they must be fully equipped for battle with weapon load and other equipment. With this view, the Navy must be ready times in hours, not days. The scenario assumes that NorTG is equipped with full weapons loads and other equipment upon departure of the Navy main base hook guard. Earliest time of arrival, the operation area at Svalbard depends type of device and what the purpose of the assignment is. From Bergen to Svalbard it is in direct line 2025 km, which corresponds to 1093 nautical miles. This implies that the frigates and the Fram class can sail directly to the area without spending too a lot of fuel on the road. Submarines will also be able to transit directly, but will with its characteristics go immersed as quickly as possible and then hold be hidden. For the Skjold class, the range will constitute an Achilles heel indicating that vessels
must be able to receive bunkers on their way to the area of operation. An operational range of 800 nm today and an increase to 1200 nm in The 2030 scenario indicates that the vessels are primarily designed to take care of operations along the Norwegian coast. An alternative route to Svalbard is to sail northwards along the Norwegian coast and then from mainland Norway at Tromsø to Svalbard area. This route would be two-part, with the first part of 800 nm from Bergen to Tromsø and then second part from Tromsø to Svalbard at 482 nm. For the frigates, this one wants The route could also be chosen if there is a point to send the force together forward. However, the route is almost 200 nm longer. In normal transit speed does this difference mean a half-time loss for a frigate? which transits in bunker economical speed. For the corvettes, this would nevertheless be preferable as this route would allow bunkering in Tromsø before crossing towards Svalbard so as to settle in the operating area. On the other hand could some of the corvettes remain on the Finnmark coast to make up a strength multiplier there and operate more in its proper element. If we put a splitting of NorTG into account for the sail to the operating area, Can a group with the large units consisting of KNM "Maud" and 4 Nansen-class frigates, be in the area around Svalbard within two and a half days (1093 nm / 18 knots). Then the economic march is based on the great ones devices that also need to protect KNM "Maud". Submarines will if they transit From the same area, be in place within three days, while Skjold class via Tromsø for bunkring will spend one day and ten hours, with an average speed of 45 button and stop in Tromsø in five hours for re-supply. This calculation shows that it is possible to get parts of the strength to the operating area one-and-a-half hours, but that a prerequisite for this will be air-militarily support. The Skjold class has very limited air protection, which makes it vulnerable to it open sea. F-35 as collaborative platform with the Skjold class, and then it remaining strength one day afterwards can constitute a significant strength multiplier in an operation. A role for the Skjold class in the scenario will be enforcing sovereignty in the territorial waters of Svalbard and assist the force to stop any landing operations with military material sea road from Russia. It is 535 nm (992 km) from Severomorsk (Nordflåten's main base) to Svalbard. This is only 54 nm more than from Tromsø to Svalbard, and it is equivalent to about half of the distance from Bergen to Svalbard. Reaction time from word to Action can thus be very short if Russian forces were to implement measures to roll out the bastion defense. By implementing a Russian action it may take just over a day before different Russian surface capacities is present around the archipelago. The Norwegian strategy with all Navy vessels of a certain size stationed at Haakonsvern in Bergen will mean that the Navy will enter an already fortified Theatre. Provided that Norwegian F-35 has not deterred Russian actions, will a hidden establishment of denial facilities such as Kalibr and S-500 missiles Svalbard through civil container-based solutions could be implemented. Russian Mistral landing vessel with a large number of helicopters, air protection from fighters and a crossing of the Slava class
can recuperate ground personnel at Svalbard before NorTG is established in the operating theater. The Russian neighborhood to the archipelago could mean that Norway will not be able to enter the operating area before large resources are used to defeat missile threat from land. Long-range Russian cross-missiles in Kalibr-The series, with ranges up to 2500 km, will allow Russia to threaten any point in Norway with conventional weapons. In an emergency situation large parts of the Norwegian fleet still lie by the dock, it can in the worst case threatened to be lying. In addition, the Russian strategic bombers can carry the new Kh-101 crossing missiles with ranges of up to 9600 km and a 400 kg warhead and Kh-555 with a range of 3500 km (Deagel.com, 2015a, 2015b). The mobility of these missiles poses a significant threat to country destinations most places in the world.

**Protection**

By protection is meant the ability of forces to take care of themselves, that is, to defend fight against attacks on your own device or by using other measures to avoid being exposed for attack. In the Norwegian force, for all practical purposes, only Nansen-class that has a real ability to exert an air defense function. Air threats can in this case be fighters or missiles. As the last line defense, Nansen-class in 2030 an operational close-in weapon system (CIWS), which is calculated on use the last kilometers in the vessel's self-defense line. Based In the described Nansen class missile configuration, they have four vessels 24 ESSM Bl II missiles each. These have an estimated range in excess of 25 nm, which corresponds to a strength of 96 missiles. In addition, two of the vessels a dedicated area airplane where the remaining VLS cells is filled with standard SM-2 missiles, in a number of 10 missiles per 69 69 vessel. These have a range of 100 nm and are suitable for protection as well other vessels in the force against air threats. KNM «Maud» is an example of a valuable vessel with high priority for protection. Without a dedicated guard, this vessel can not is expected to survive the first possible strike. A shield-class vessel that has selected ESSM in, for example, two of its NSM launcher cells, will be able to to protect yourself in an air defense situation, but can not protect others without that this is at the expense of self-protection. Anti-overflatemissiles rarely come alone. Air protection against incoming In other words, missiles are material intensive. The rain formula that was put up in the section on firepower above, shows the principle behind this claim. The example of 6 NSM to neutralize a Nansen class shows that The air defense platform to handle the incoming threats will Use a significant amount of your own or the force's missiles on a single attack. How many missiles that can be shot down depend on several conditions. Before First, the configuration of the vessel can be recorded. An air defense configured Frigate with several types of air defense missiles can probably handle multiple simultaneous threats than one with only one type of missile. This depends on the threats comes above or below the horizon, which again determines when detection of threat is possible. Secondly, it may mean a lot if the vessel sails as part of a
strength or operating alone. In a strength, devices can relieve each other by hand about more incoming missiles each and thus decrease the likelihood to be hit. The threshold for measuring the strength can thus be greater than that for A single device, which sooner or later will release missiles through the defense. Thirdly, the number of self-defense missiles comes in. It is used fast defense missions in a two-to-one relationship to the number of threats. Put in such a perspective 96 missiles of the type ESSM B1 II and 20 SM-2 are not much. In comparison has an American Arleigh Burke class destroyer 32 VLS cells before and 64 VLS cells aft - a total of 12 modules with Mk-41 launchers. This is 6 times more cells than the Norwegian frigates. An American destroyer will have more firepower in the form of missiles than all the Norwegian frigates together. 70 70 Whether surviving the first fierce game with the enemy depends on an adequate one number of self-defense missiles. Based on the Nansen class example 10-12 self-defense missiles are needed to deal with threats. If several devices would be attacked in parallel or multiple times, will be strengthened missiles will be emptied quite quickly. A future tactic for emptying The opponent of self-defense missiles is to use both anti-missile missiles and cheap drones in formation against a vessel. This can cause the air defense to become saturated or emptied against fake targets. Another factor that can make air defense complicated is the use of ballistic ammunition without advanced logic, such as artillery grenades or bombs. Such weapons can protect an opponent in large numbers from both air and air surface and cause the defense systems to go saturation or consumer its ammunition. Available missile capacity can be one for such reasons challenge, especially since the vessels can not receive after-sales of weapons in the sea, but have to kay to do this. The term protection also includes the value of a reliable and up-to-date situation picture of the force operating in the theater. Availability at airborne sensors that can identify contacts around the force are significant to keep track of an appropriate situation. Introduction of organic unmanned air and surface platforms will make a formidable difference compared to just relying on your own sensors like radar and optics that are surface-based. Sensors that are located on board, it has the weakness that they do not look optically what moves outside the horizon of the vessels due to the earth's curvature. The radar on board will could detect objects slightly outside the horizon, but then only suitable for the detection of aircraft or missiles flying at a height that makes them visible in one straight line from the vessel that observes them (above the radar horizon). Detection of objects far beyond optical viewpoint is important to identify, ie determine which type of vessel or aircraft has been observed. If you can Utilizing unmanned platforms for this purpose can be the strength protected far more efficiently. Another possibility to implement this identification is to use own helicopters. These have limited flight time and would like to be busy with look for submarines or other types of missions. If the strength is supported 71 71 fighters, these can be effectively used to provide the vessels with updated information about contacts of interest. At the same time, it will fly
back and forth over large Distances to provide this type of information could cause the aircraft to run empty for fuel. On the other hand, an organic unmanned platform could operate around the strength and provide badly requested identification information contacts observed, as well as target data for vessels and aircraft without this beyond the persistence of the weapon delivery platforms in the strength. Contributed to An updated situation image can thus create better security and basis for action in the force. It is not only protection of the strength of the sea which is important. In a scenario like involving sovereignty disputes on Svalbard and a deployment of the Russian bastion defense, it is likely that Russia will also have taken its precautionary measures on the hill in Norway. Because we must assume that the Russians are familiar with ours operational bases and the logistical supply that is required Considering bunkers and the like, it is likely that this will be affected in one form or another. Agents and special soldiers may be sabotaged bunkers facilities in northern Norway and put some quays out of play. We can nor disregard the sabotage of Norwegian naval vessels that add to the docks before departure. As Norway has chosen a strategy where the resources largely is concentrated around a main base per weapon, this is a vulnerability one opponents must be expected to exploit. The term "many eggs in one basket" is indicative of the defense Norway has by 2015. The defense in 2030 may be better due to the capacity that is promoted in the scenario, but it will also have its vulnerabilities. The threat from increasingly capable conventional missile systems enable Russia to shoot cross-missiles from their own territory and now all points in mainland Norway. The Russian missile system Kalibr has similar ranges as Tomahawk. This means that Russia's own version has reaches 2500 km and high precision. In an early phase of an attack on vital interests will be important social structures and defense installations could thus be eliminated play before they pose a threat. Thus, air protection is not only important on board, but also around Norwegian bases. Protection will largely be a factor for F-35 fighters. With them 52 planned aircraft will Norway have Northern Europe's largest holding of F-35. IN A maritime situation as described in the scenario, the fighters will have a strong role in protecting important installations in an initial phase, a phase where Other defense systems are being moved, but also in conjunction with the maritime the strength at sea. The F-35 and the Nansen class have good sensor and weaponry prerequisites for cooperation and the planes could improve the protection dimension dramatically. However, the prerequisite is that the hunters have a runway to take off. Taking out the operational air base or fighters and submarines has been spoken Russian ambition in the event of a conflict situation with Norway. Without the two capacities, the threshold will have little deterrent ability. Since the start of the Cold War, Russia has invested heavily in developing advanced missile systems. This was originally a consequence of the country numerical and technological sublime in relation to the United States. The development of missile systems has resulted in Russian anti-christian and cross-missiles powerful and
widespread in Russian forces. Russia has unlike the West given supersonic missiles high priority, these poses a significant threat against surface vessels. The missiles can be delivered from the air, from surface vessels, submarines and land-based units. In a 2030 scenario on Svalbard, they want Norwegian. The device's ability to self-protection thus quickly becomes challenged by these fast and long-range missiles. In the case of surface missiles, all surface units in the scenario, except the Mistral class, the ability to carry the P-800 Oniks missile. In addition, will Submarines of the Jasen class probably have the ability to carry these. Oniks is a supersonic missile with a speed of mach 2.5, range of approx. 300 km and a warhead of 200 kg TNT equivalents (Schwartz, 2015, p. 2-3). In the terminal phase like can be programmed, the missile goes down to a height of 5-15 m above sea level. This results in a detection distance for a modern Navy vessel like (without support from airborne devices) is around 20-25 nm. From this distance, use missile 44-55 seconds until it's on the skid side. During this time shall the target vessel's systems detect, locate, identify, get stable echo on their systems, and engage with their countermeasures. If one is used advanced self-defense missile at a rate that corresponds to the incoming missile, the most effective systems will have a reaction time from detection - provided the systems are automated - in 10-15 seconds. This means At worst, the Oniks missile is at 30 seconds before hits reach their own countermeasures are being shot. If the countermeasures hit the missile, this will happen 15 seconds before Oniks reaches the shooting side, or equivalent 12 750 m. By boom there will be minimal time left for a new attempt from the target vessel. The Kalibr 3M-54 missile, which can be worn by the same vessels in the scenario, has greater warheads and even longer range. In addition, the missile has a sprint pattern which is separated from the missile in the final phase and accelerates continuously towards the target. The drones accelerate from subsonic speed to mach 3. This missile creates Even bigger challenges for the target vessel, both in terms of reaction time and form of goal follow-up. Assuming that the Russian tactics use Saturation attacks from multiple directions to overwhelm any target vessel systems, this will mean that own self-defense systems will not be enough to fight all threats. In such a modern setting, the target vessel will be Depending on air support to detect the missiles early, as well as weapon platforms and weapons that can fight the threat before it reaches the target area. For Norway will this mean support from F-35, secondary any resources from NATO in one Article 5 situation. Here it will limit the number of available flights and stand-by in the surgery area is a challenge. Norway does not have a hangar ship which can increase the availability of the aircraft in the operating area, nor is it a tanker. The nations that can contribute with this kind of capacity are NATO Allies like the UK and the United States. In order to take out air threats under the horizon, it will be necessary network centric capabilities that can exchange target data seamlessly, such as The US system CEC 28 - Cooperative Engagement Capability - is able to. Then the sensors in an area will be able to talk together, allowing everyone Devices
have the same target image. The sensor with the best data on a target provides target data and the weapon best suited to combat a threat are used to defeat this as long as possible. Such a system will on one side help against a wide range of threats. On the other hand, vulnerability reached by metering attacks when the threats are supersonic and the number exceeds vessels' weapon capacity and self-defense capability. The limitation in the number of self-defense missiles is a challenge in conflicts where the number of threats are many. If we consider the technological innovations that may be required in a 2030 scenario will be the missiles which figure out as threats, likely to be upgraded with advanced countermeasures such as digital radio frequency memory (DRFM), jamming and own decoys. This will make it even more challenging to hit the missiles coming against the goal, as jammers make false targets for the fire management system. At worst 28 CEC is explained in the following video: <https://www.youtube.com/watch?v=WumIk1MwVPM> 74 74 the target vessel will shoot a number of unnecessary self-defense missiles against fake aim and thus clear themselves for missiles faster. In the 2030 scenario, the Norwegian frigates are equipped with ESSM Block II missiles for self-defense. These are equipped with a missile searcher with both semi-active and active mode. This means, on the one hand, that they can take targets like the vessel Using its fire management systems, actively illuminate the missile on reflected energy. On the other hand, the missile can actively use its own Seeks to find and heal against a goal without this being highlighted. The advantage is that Several incoming threats can be taken down at the same time as the number of illuminated on board On the device that defends itself, will not be a limiting factor. However this property will allow the vessel to clear its self-defense stock faster and without all threats necessarily being shot down. That the Norwegian The devices are only equipped with 2 VLS batteries, in this way, will appear as one great weakness if a strike should occur.

**Intelligence**

In the section on mobility, some challenges are described as at worst can immobilize Norwegian devices before they come into play. An active method In order to counteract this, timely intelligence and a plan that imply that various emergency preparedness measures are implemented with a warning of disturbing activity in attachment to the Norwegian area of interest. To achieve timely intelligence is The crucial thing about good situation overview and ability to gather information over time, so changes in the normal situation are perceived quickly. One way to achieve This is through continuous presence in Norwegian interest areas both on land, by air and at sea. The strengths of the sea are dependent on threat data in order to improve their own survival while military strategic management will need Information about purpose, ability and willingness with different actions. In the escalation of a conflict, notification time will be one of the
most important parameters. The Navy can collect a sensor through its sensor equipment mixed information about activity in its area of operation. This can passed on to expertise that can analyze the information and report 75 75 this to the correct instance. By having Norwegian navy vessels with impact force present Over time in areas where crises can occur, Norway will be at the forefront if other players enter the area with military or other capabilities. Continuous presence requires a good device for logistics, either in form of nearby base structure or vessel. Presence of unmanned aircraft in the form of a high-flying MQ-4C Triton can give Norway an advantage of early warning in the scenario. However, is It is possible that Russian capabilities will soon be put in order to blind or at worst fall remove this craft. This can be done using antelope systems or jammers that cause the vehicle to crash or explode mysteriously show. Russia is likely to postpone necessary capabilities on Svalbard in the hiding to achieve the benefit of an established foothold before a crisis escalates parallel to the situation in the Baltics. Regular patrols and flights with F-35 in the Norwegian area of interest can help make hidden hidden establishment on Svalbard, as an active measure against a Norwegian fighter will trigger a crisis in itself. Active presence also with submarines on patrol in the High North will contribute to a higher military threshold and strengthen Norway's ability to deliver hidden intelligence over time.

**Logistics**

For offshore operations in 2015, the Armed Forces are characterized by a great lack of progress logistics capacity, especially in the form of bunkers. The new logistics vessel KNM "Maud" will be able to improve this situation considerably by its ability Longer tear strength support. On the other hand, KNM will «Maud» require additional vessels and / or aircraft for protection during operations. Since logistics vessels are traditionally badly ordered for self-protection, they are goal of high value for the opponent. They are also simple goals if it is known to the opponent where they operate. Keeping the logistics vessels outside A high-risk area can thus be considered as a protection in itself. For the Skjold class part is the limited endurance in the form of bunkers a challenge as this implies that the devices must operate in the same area 76 76 as the after-sales unit. The alternative may be to go on shuttles to mainland Norway to fill fuel, thus not staying in fishermen's zone over time. An argument can thus be that the Skjold class without its own logistics base in the operating area is best suited to mainland- Norway so that it can enter fixed bunkers to be supplied. Then the vessels can be used for needle piercing operations from the Norwegian coast, something which possibly will suit the vessel's design better. On the other hand, this can result in the opponent seeking to sabotage or neutralize the logistical the solution on the mainland. The range of NSM causes the power to lose weight parts of its anti-surface capacity around Svalbard if the Skjold class must operate from the Norwegian coast. From having 80 NSM available, the strength will be on time Only have 32 NSM available if only
Nansen class is in this area. With two vessels present around the KNM "Maud" to protect her, only two wanted frigates are available for operations of a more critical nature. The vulnerability of the logistics in the operation scenario describes Therefore, the logistics vessel should be retreated by the Norwegian coast and carry out after-supply in open waters if required, protected by fighters. Maritime logistics is not an equal challenge for the Russian surface vessels, which is generally larger than the Norwegian ones. Some are even nuclear-powered, something which gives them a standstill in the field of operation only limited by provision and Weapons amount. Both the Leader class and the Kirov class are powered by nuclear power.

Summary

Among the military's nine core tasks is the first and most important to be one war prevention threshold based on NATO membership (Armed Forces, 2014, p. 10). In the Svalbard scenario, the most important contribution to a naval force may be to constitute a credible military threshold. The Great Military Modernization in Russia demonstrates a major effort on submarines and missile technology for delivery over major distances from both land, sea and air. containerized Missing solutions that can be hidden in several types of situations represent a new challenge. 77 77 Russian presence in the operation area means that the Norwegian The force meets a fortified theater, with capabilities that surpass the Norwegian surface vessels ability to self-protection. Restrictions in endurance Among the smaller Norwegian surface vessels, the force must bring Logistics on refrigeration, which the Russian nuclear-powered vessels are less dependent on of. The logistics situation also makes it difficult to use the Skjold class Svalbard. Instead, the scenario will require this capacity to remain along the Norwegian coast, or it must have air support to cross the Norwegian Sea and Barents Sea. The consequence is that less than half of the Norwegian NSM will be available in the operating area. With the introduction of advanced Russian technology in the theater in the form of unmanned aircraft, aircraft and space-based sensors, it will be possible to obtain target data for long-range cross-missiles and anti-missile missiles of the type Oniks and Kalibr in the whole theater. Russian interoperability and network integration are full with the western, and the Russian advantage of weapon coverage gives extra power to a denial strategy. For the Norwegian surface vessels, the challenge is that Too few missiles are available for self-protection and vulnerability Therefore, the logistics vessel that binds up resources for protection will be large. An obvious consequence is that logistics must be withdrawn. Long-range Norwegian cross-missiles, like Tomahawk from fighters, submarines and frigates can help reduce the benefits of the Northern Fleet somewhat. This the capacity represents a significant strength multiplier. This is due to the missile's ability to work assignment, long range and different types of fighting habits. In a scenario where Russia has the ability to deliver advanced conventional missiles across distances throughout the bastion will be the biggest challenge for Norway is to enter
the theater with surface vessels without the risk of loss. The most plausible Norwegian measures could be a combination of surface strength supported by fighters and submarines of the Neptune class. They are equipped with long-range Tomahawk cross missiles and heavy torpedoes, and can be used to neutralize targets both on land and at sea. New modern Missile defense systems like Railgun and ship-based laser will not help underwater threat, which appears as far as the dimension where you are can still operate virtually freely in the operating theater. Air protection from F-35 is a prerequisite for the Norwegian surface vessel's presence. Exploitation of unmanned platforms for NorTG can contribute to increased situational understanding for own devices and thus better warning time. 78 Due to its base structure, the Norwegian defense runs an obvious risk to be reactive and to end up in pursuit. As Norway has concentrated much of their resources to one main base per weapon, this is a vulnerability An opponent is expected to exploit. The distance to Svalbard also goes in Russian favor. One consequence may be that Norwegian units never come from kai, due to sabotage or the ability of Russian cross-missiles to threaten units to stay at the base. To take out the operational air base or fighters and the submarines have been a pronounced Russian ambition in a conflict situation with Norway. Without the two capacities, the threshold will have little deterrent ability. Effective and fast relocation to and within the operation theater is crucial in order to establish an effective threshold. The navy must therefore be ready Walk with full equipment on hours, not days. To avoid the problem To come last into the theater can speak a lot for continuous presence in the area of submarines, vessels and aircraft with long-range cross missiles. This can contribute to a visible threshold if Russian forces were to succeed in Norwegian areas. The danger of weapon use against Norwegian units will then be less, as such an attack will cost a lot and could easily trigger NATO's article 5. Introduction of the Leader class in a number of three vessels can be seen as one restrictive measures in Russian favor and make Norway dependent on allied help, if The situation is not resolved diplomatically. The low number of units in the Norwegian structure means that comprehensive grip must be done taken if Norway's presence in the north is to reach an adequate level. Good intelligence can help to provide Norway with the necessary notice time for one Russia that has demonstrated significant ability and willingness to act quickly. 79

Chapter 4 Surprised or prepared? This chapter aims to discuss the gap between the capacities of today Navy has and the capacities that are required for the 2030 scenario. It will be Proposed any measures to reduce or close the gaps.

What new capacities does the Navy have in 2030?

Today's Norwegian Navy consists of 23 combat vessels besides logistics vessels. The Navy is for all practical purposes finished modernized after the restructuring which has taken place since the end of the Cold War. To illuminate which capacity
The Norwegian Navy in 2015 The Norwegian Navy in 2030 Type Hovedkapabiliteter Type Hovedkapabiliteter 5 Nansen class frigates 1 MK 41 VLS with 32 ESSM 1 76 mm OTO Melara cannon 8 NSM Stingray torpedoes Hull mounted and rope sonar Prepared for NH-90 helicopter 5 Nansen Class frigates Upgrades: 2 MK 41 VLS with possibility to carry ESSM Bl II, SM-2, JSM, and Tomahawk 1 x 127 mm cannon 1 x CIWS NH-90 helicopter with possibility to carry NSM / JSM Unmanned tactical aircraft 6 Shield class corvettes 76 mm OTO Melara cannon 8 NSM 1 Mistral SAM pad 6 Shield-grade corvettes Upgraded with opportunity to wear ESSM Bl II in NSM launchers Improved bunkers capacity for 50 % better range 3 mineryddere and 3 mining vessels Swing capacity for mines ROV (Remotely operated vehicle) Hugin - unmanned underwater vehicle for mapping of bun- nobjekter 1 parent vessel for deployment of autonomous subsea systems Autonomous Hugin Systems for mine hunt and minesweep, as can Shipped by car, airplane or vessel and operated from various platforms 6 Ula class submarines 8 × 533 mm torpedo tubes 14 × AEG DM2A3 torpedoes 6 Neptune-class submarines 6 x 533 mm torpedo tube with opportunity to carry heavy over-flat torpedo and cross missiles (Tomahawk) MIDAS missile system for protection air pollution threat AIP propulsion 1 Coastal Hunter- command 1 Battleboat 90 group 1 ISTAR - company 1 tactical droneteam Deployable team operating unmanned systems in the air and on the surface 1 logistics vessel: KNM «Valkyrien» Fuel and material- supply primarily for corvettes 2 Front-class logistics- kfartøy Subsequent supply of bunkers (8000 tonnes), parts, supplies hospital Capacity Space for 2 NH-90 including heavier maintenance Space for 30 standard containers 1 ESSM (Evolved Sea Sparrow Missle) self-defense missile with range 10 nm.
The table shows that the frigates of the Nansen class are continued, but upgraded significantly from today's equipment. The supply of one extra MK-41 VLS module is central. This allows the vessel to carry more missiles and thus increasing their assignment capacity. A prerequisite for solving assignments as protection of other devices, as well as constitute an offensive threshold capacity is that the vessel is equipped with area air protection and cross missiles. A prerequisite for solving assignments as protection of other devices, as well as constitute an offensive threshold capacity is that the vessel is equipped with area air protection and cross missiles. Area Airborne 81 is in the form of a mix of new ESSM Block II (a program Norway participates in) as well Standard missiles are therefore introduced. On the cross-missile side, the ability to carry Tomahawk is included, as The VLS modules are prepared for this. Increased self-protection ability through The introduction of the CIWS system is also added, as the ability to meet increased Missile threat through a lawful self-defense is essential to the survival of the vessel. As the trend of the Russian Navy has shown in the scenario, it is decided the vessel's organic helicopter. Operations in an area that traditionally has Had little expanded infrastructure, may require own mobile communication and image exchange solutions are brought. The use of unmanned tactical and Big airplanes can be a way to do this. The Skjold class, which is primarily designed for coastal operations, has got two significant upgrades in the scenario. This is, for the
first time, increased stamina through a 50 percent greater bunkers capacity, allowing the operating radius until the vessels increase to 1200 nm. This can enable them to operate over longer distances in a situation where it is necessary to deploy from Norwegian coast. The second upgrade is the ability to carry antacine missiles in the NSM launch cells. This capacity can give the vessel an ability protection against air threats in open waters, which is a prerequisite in one high threat environment today. As for the mining vessels Norway currently owns (2015), this type is considered vessels less important in a future scenario, primarily because of this of development in unmanned underwater vehicles. unmanned Solutions are therefore required in-phase as a replacement for today's solution. This was not further processed in the scenario, as the operation area does not indicate that mining threat is a priority. Such a threat is more relevant in a scenario like i to a greater extent affect the mainland coast of Norway.

New Norwegian submarines are a very significant capacity in a future scenario. The Ministry of Defense points out that submarines, combat aircraft and special forces are The military's most important capabilities and that the ability to operate hidden will be significant better with a new submarine than in a submarine of the Ula class (Ministry of Defense, 2014). A submarine that can provide long-range cross-missiles against sea targets and land, as well as heavy torpedoes against surface targets, are considered necessary capacity in 2030. Tomahawk cross missiles are therefore a significant change from today's submarines. Self-protection in the form of the MIDAS antelope system is also included, as the density of airborne sensors in the future will be significant higher than today. The front-class represents a significant improvement in the 2030 scenario with today's navy. The ability to recycle vessels at sea in sufficient Volume is a capability Norway has been missing for a long time. The fact that Fram- The class is without the ability of self-defense, yet has both pros and cons. The resources that must be used to protect the vessel will be significant, so This must be considered against the importance of after-sales. In addition to the Navy's own capacities, I have included it in the scenario allied capacity MQ-4C Triton 29 , a strategically unmanned aerial vehicle like can be seen as a mobile satellite in an operating area. This type of capacity is very important in a future scenario, as it will give the Armed Forces a significant better information and situation image in a current operating area. As Explained in Chapter 3, the notice time is essential for the survival of a vessel defended by anti-missile missiles. Airborne sensors can through their overview give vessels a significantly better warning about what comes under the vessels own radar horizon. The Norwegian fighter plane F-35 is of course also an important piece in a future crisis scenario. Their ability to protect a maritime force, as well as combat Current air and surface threats are a prerequisite for entering an area of such a character. In order to contribute further to Norway's threshold defense, the planes are also equipped with the ability to carry long-range cross-missiles. 29 Triton are the
unmanned aircraft included in NATO's ground surveillance, part of the so-called SMART defense principle.

**What gap is not covered with the prescribed structure?**

The scenario in this study has emphasized the challenges of a Norwegian force will face if it enters an operating theater where Russia already is present with capable military units - especially Leader-class destroyers, missile batteries on land, submarines and air support. The Russian Defense has good communication and image solutions. With Russia expected sensor networks, the country will probably achieve information supra in operation area also by denial. By this is meant to jamming and others funds can be set against Norwegian capacities to reduce our access updated information. This makes it difficult to enter the operating theater without having unpleasant surprises. One way to reduce this gap can happen by establishing a national information structure that is robust in form of available unmanned systems, fixed-stationed relays on land and national communications satellites. Increased investment in sea-based water sensor networks could also be one solution for mapping surface traffic and establishing early warning about activity in Norwegian jurisdiction areas. Introduction of advanced networks for command and control, combined with long-range precision weapons on land and sea, allows one who has first established himself in an area to have one operational denial benefit. The result for surface units at sea can be found in one. Such a case is claimed to be a no-man's land (Krepinevich, 2015, p. 5). This speaks for a further investment on submarines, as these can operate in one the domain that is not affected by systems that are affected sea surface. In the scenario, Norway is set up with six new submarines. In light of it The freedom the submarine's domain represents, and the technological innovations which will come within unmanned subsea systems, should amount Submarines have unconditionally been higher than six. The section on mobility in the previous chapter shows that Russia has the advantage of shorter distance to Svalbard. From the Navy's main base, Haakonsvern is that 2025 km to Svalbard, while from Sevromorsk is 992 km. This may cause that the maritime force will not get established in the operating theater without danger of being neutralized by Russian forces on their way forward. In practice, the picture is however, more complicated. Introduction of long-range conventional country missiles indicate that Russia can hit any point in the mainland Norway from its own territory. Russia can carry out pre-attacks and harmless threats from Norwegian territory. A threat of removing devices The leaving port can be used to force Norway to refrain from military action. The threat can also be used to get devices that are at sea back to the dock, with the promise that no offensive funds will be used if Norway keep calm in the situation. Norway today has a base structure that largely involves placing all the eggs in one basket.
We have thus caused ourselves a vulnerability that is difficult to fine on without significant investment, either in the form of an exceptionally good air defense around the Armed Forces main bases, or at the creation of more bases to spread the structure. The most effective can nevertheless be a structure as for most are in motion. This involves active operations in line with it defense policy ambition for increased presence in Norwegian interest areas. Norwegian submarines that dock at a maritime base will probably be the first The goal Russia will take in an appropriate situation. This is the most valuable Threading capacity in Norway has. Protect and hide for submarines to kai would remedy this vulnerability. In the 2030 scenario, Russia has a comprehensive range of cross-missiles based in all domains. This bet combines long reaches and supersonic missiles against sea targets. The assault strategy indicates that Russia can perform metering attacks. For an actor who will resist such attacks, it is important not to be seen. As Andrew Krepinevich writes:

... the combination of high-speed, precision-guided enemy missile forces and the absence of effective missile defenses skapar en situation hvor man skal se er at være underlagt disabling attack (Krepinevich, 2015, p. 45).

For Norwegian surface vessels in the operation area around Svalbard involves missiles and submarines of the Jasen class a significant threat. Quantity available weapons indicate that the Norwegian units will soon be bled for missiles both self-defense and attack. The superior range of Russian anti-missile missiles Compared to the Norwegian is a challenge that can make it difficult to operate in the theater, especially since the Russian threats are largely supersonic and provide 85 minimal reaction time. As the submarines can deliver anti-missile missiles so close Norwegian vessels that the notification time is almost eliminated, it is nearby to assert that the Norwegian Sea and the Barents Sea between Norway and Svalbard become one high-pressure zone for Norwegian surface units. The introduction of Tomahawk remedies this situation somewhat, but the modest amount of defensive missiles in the Norwegian force could result in loss of surface vessels at first hit The Skjold class will make the best use of the Norwegian coast topography to hide, or do needle stick operations against current Surface finish at goal solution. An exposure of the Skjold class on the open sea can mean the safe death of this vessel type. If the Skjold class should used around Svalbard, it is dependent on air support to arrive. Another concrete measure that could improve the survival of the Norwegian frigates, is to expand the capacity of missiles on board, as well to acquire ship-based laser as a self-defense system. However, this is very costly. It either involves extending existing frigates to make room for more systems, alternatively to sell them and phase in new ones vessels until 2030. With cruise missiles and torpedoes Norwegian submarines can inflict Russian surface capacities significant losses. Whether we assume that Russia has a limited number of advanced long-range ground-based missile systems, can a combination of
submarines and F-35 with Tomahawk be thought to balance the threat in a tense situation. If you want to ship Norwegian surface vessels into such an operation theater, however, several prerequisites must be fulfilled. First, Russia's ability to measure distance over time must be neutralized, so that the long-range weapons can not exploit their superior range. Secondly, the submarine threat must be combated at a distance when using airborne platforms like helicopter and maritime patrol aircraft. Norway is in the scenario without maritime patrol flights, which impedes both submarine hunting in a distance and use of NH-90 helicopter. The equipment modern submarines is in shape of antelope missiles means that the Norwegian helicopters will be exposed. In summary, it would appear to be too risky to ship surface vessels into the current threat area in an early phase. Submarines can pave the way for gradually creating visible presence with surface vessels in the operating area.

**Reaction Pattern**

In the 2030 scenario, it is assumed that Norway is reactive in its reaction pattern. What if Norway had behaved differently? If Norway had had one Continuous presence with new submarines and frigates with long stretches precision weapons in the operation theater in advance, it might be thought that the military The threshold had been big enough to deter Russia from getting ready in Norwegian jurisdiction. Should Russia still use military power, it would undoubtedly be an article 5 situation, that is, war between NATO and Russia. However, this is, after all, judging a situation Russia does not will want and it will therefore be in the country's interest to keep the crisis in the north with Norway at as low a level as possible. Consequently, Norway may have to deal with the situation itself to a much greater degree than desired. On the other hand, Norway may, in turn, choose to escalate the situation to a level that will trigger Article 5 and bring NATO into actor. Alternatively, one can for example monitor the situation from Norwegian territorial waters and, as the Russians, establish a similar hidden presence in Svalbard. Monitoring will be one passive action that will not necessarily trigger any reactions. In that case Norway will tacitly accept a deployment of the bastion defense as thereafter can take care of parts of Norway's jurisdiction. It is still a bit Probably that the latter will take place, as Norway is a NATO member.

**What measures can reduce the gap?**

The situation that occurs in the 2030 scenario happens quickly and without significant notice. For Norway, this involves timely intelligence, monitoring Norwegian interests and adequate preparedness will be important. All of this can help to buy reaction time. In order for the Armed Forces to be able to react Soon enough, most of the military structure should be operational and on patrol or ready to walk. Through continuous presence with submarines and surface units in
Norwegian northern areas, Norway can avoid harboring in pursuit of a demanding situation. If the crisis is to be waived, will One relies on discovering measures such as deployment of the container-based Navy pollution missile systems in Svalbard, which again will Require resolute and timely action. This in turn assumes that the Norwegian The military threshold is visible and credible. The gaps that have emerged in the 2030 scenario indicate that Norway must bet further on offensive measures to meet Russia's military modernization. The In the broader sense, Norwegian defense can be more robust and credible through increase the protection measures for our surface units, procure offensive weapons with longer range and ability to beat both land and sea goals, as well as to bet comprehensive on new survival technology. As for submarines, all the arrows in the analysis point to the fact that Norway should acquire a significantly greater number of submarines than existing ones structure. Submarines are the ultimate threshold weapon at a time when modern sea and ocean Territorial missiles with huge ranges push maritime surfaces still further away from fortified areas and current operating theater. submarines with long-range weapons and a well-developed command and control network can also help pave the way for other capacities by denying others to exploit Norwegian sea areas. In addition, the analysis indicates that it is important to Be continuously present with visible and capable capacities, such as fighters and frigates with long-range weapons. If Norway establishes a practice By being present, one can avoid coming back afterwards. Another measure that can reduce the gap in Norway's disfavour is more frequent intercourse and exercises with our Allies in the High North. Some allies have another view Norway on principles and practices for the exercise of authority on and off the archipelago of Svalbard. In this case, intercourse in the north is about measures to ward off a potential conflict through showing unity in the alliance and strengthen the capacity where the need exists. A possible military violation of Norwegian sovereignty will in many cases point to Article 5 and those alliance obligations this entails. 88 In summary, we can say that the ability to buy time through time Intelligence is important in order to reduce the deviation between the capacities that are assumed for the 2030 scenario and the capacities Norway has today (2015). New submarines with long-range cross missiles like Tomahawk and heavy torpedoes will be the most effective threshold measure in the high-risk environment the scenario describes. New fighters with long-range cross missiles can further reinforce such a war-prevention threshold. Visible measures like Continuous presence with capable and updated surface capacities is also of great importance. A prerequisite for the vessels presence is that the ability to self-defense and arms delivery is in proportion to the threat in the actual operating area.

Summary and discussion of main findings

This study has used a case in the form of a future scenario on Svalbard in 2030 to illuminate the two-part problem:
1. What is the Navy's contribution and role in a security crisis and armed conflict in the High North?

2. What capacity and capacity gap exists in the Navy in relation to threat picture in the High North?

In the following I will summarize and discuss the study's main findings, reflect over any possible consequences and point to some topics that are suitable for further research. Russia's actions in the international arena in 2014-2015 have contributed greatly that state security has again become more prominent in Norwegian security policy. Norway is a small state in the international system, and Russia's focus on military modernization as well as conquest of another country's territory leads to uncertainty about the country's further intentions. The security policy (new) realism in this way contributes to a better understanding of Norwegian security policy.

Norway has traditionally sought protection from the United States and NATO to achieve Security against the Soviet Union and Russia. Important in this context is Norway's handling of a security issue that is expressed in one balance policy. Continuity in Norwegian security policy vis-à-vis Russia has traditionally consisted of deterrence through integration into NATO on one side and calming through shielding action against the alliance on the other side. Russia is a strong opponent of the United States position as the unipolar hegemon and instead seeks to promote a multipolar world order with Russia as a key player. It is therefore fruitful to see Russian politics a realism perspective, where power prevails and the strongest does what it takes to ensure their own influence. A security policy crisis at Svalbard could potentially escalate to one armed conflict. Because of the archipelago's distinctive constitutional status Norway may be able to deal with the situation alone, for example as a result of disagreement among the treaty countries on the exercise of authority. Any change in Norway's presence and behavior in the High North, which is close to the Russian navy's main base will be guarded with argus eyes. The possibility of misunderstanding And for defensive action to be perceived as offensive and as escalation is undoubtedly present. Consequently, it has become increasingly important to maintain one Norwegian modern seafarers capable of enforcing Norwegian jurisdiction and territorial integrity in a clear and predictable way. The most important core tasks of the Armed Forces are to constitute a war-prevention threshold based on NATO membership. In the Svalbard scenario, anno 2030 the most important contribution to a naval force can be to make a credible one deterrent military threshold. The scenario in 2030 assumes that Russia intends to do seriously of the plan to rebuild a Greater Russia. The country is implementing Preparatory military measures both in the Baltic Sea and at Svalbard in the north, and Norway is thus under pressure as part of the rollout of the Russian bastion defense and due to Svalbard's strategic importance for the North Fleet. The ongoing major military modernization in Russia causes it to be waged heavily on both submarines and missile technology for delivery over long
distances from both land, sea and air. Container-based missile solutions represent a new challenge, as these can be kept hidden in several types of situations. A theatre consisting of a wide range of conventional cross-missile systems and Air defense systems can be the main challenge for maritime strength and the defense of a future conflict. With the introduction of advanced Russian technology in the theater in the form of unmanned aircraft, aircraft and space-based sensors it will be possible to obtain target data for long-range cross-missiles and anti-missile missiles of the type Oniks and Kalibr. Russian interoperability and Network integration is fully in line with Western and Russian The advantage of weapon coverage gives extra power to a denial strategy. The 2030 scenario on Svalbard represents a significant challenge for it reactive Norwegian action pattern, where the Navy initiates the operation from home base located far from the operating theater. This challenge is twofold. First, the collection of resources around one main base per weaponry represent a vulnerability that an opponent may be expected to exploit in a conflict. A concrete consequence may be that Norwegian units never come from kay, for example due to sabotage or Russian cross missile's ability to threaten units at base to stay. To take out the operational air base or fighters and submarines have been pronounced Russian ambition in the event of a conflict with Norway should arise. Without These two capacities will have a deterrent effect on Norway's threshold defenses. This vulnerability can speak for significant Norwegian resources to be used for increased protection of existing main bases, or risk spreading by create multiple bases. Effective and fast relocation to and within the operation theater is essential to establish an effective threshold. The marina must therefore be ready for passage With full equipment on hours, no days. Alternatively, mobile devices may need to be continuously deployed and present in Norwegian interest areas. This can contribute to a visible threshold whose Russian forces would like to take action in Norwegian areas. The danger of weapon use against Norwegian units is assumed to be less, as this will cost expensive and easier trigger article 5. Simultaneously Russia can perceive this as an escalation, especially if continuous presence means more heavier military capabilities in the High North the Russian bastion. The second aspect of the challenge is that Russian presence in the operation theater will result in a Norwegian surface matine meeting an already established theater, with capabilities that exceed the Norwegian surface vessels' ability to self-protection. Restrictions on endurance to the smaller Norwegian surface vessels cause that the force must bring logistics on refrigeration, something that Russian nuclear-powered vessels are less dependent on. The logistics situation also makes it difficult to use the Skjold class at Svalbard. Rather, the scenario will require this capacity remains along the Norwegian coast, or it must have air support for to cross the Norwegian Sea and the Barents Sea. The consequence can be that less than Half of the Norwegian NSM will be available in the operating area. For the Norwegian surface vessels, the challenge is too few missiles available for self-protection and
vulnerability of the logistics vessel as binds up resources for protection. One consequence is that logistics must be retracted. Long-range Norwegian cross-missiles like Tomahawk from fighters, submarines and frigates can help reduce the North Sea's benefits. Increased missile capacity represents a significant strength multiplier due to the ability of the missile mission adjustment, long reaches and different types of fighting heads. The biggest challenge for Norway will be to enter the theater with surface vessels without the risk of loss. The most plausible Norwegian measures will probably be a combination of submarines of the Neptune class and surface strengths supported by fighters. Equipped with Long-range Tomahawk cross-missiles and heavy torpedoes can submarine could be used to neutralize targets both on land and at sea. Such a capacity will pose a significant threat to Russian vessels and installations and can raise the military threshold in Norwegian favor. If Russia puts in a number of three vessels of the Leader class, it is considered a threshold measure in Russian favor. This will make Norway possible Depending on Allied Help, if the situation is not resolved diplomatically. Still will Modern missile defense systems like Railgun and ship-based laser do not help against the underwater threat, as far as is the dimension that still can operate virtually freely in the operating theater. To raise the Norwegian venture Submarine capacities are therefore essential for establishing a necessary military threshold in a scenario in the upper part of the conflict scale. Moreover is Air protection from Norwegian F-35 is a prerequisite for Norwegian surface vessels presence in a Svalbard scenario. Utilization of unmanned platforms for NorTG can contribute to increased situational understanding for own units and thus better warning time for strength. Good intelligence can be crucial to obtaining Norway's notice period facing a Russian player who has demonstrated considerable ability and willingness to act quickly. This also speaks for an increased Norwegian focus on presence and infrastructure in the High North.

Consequences

The scenario chosen in this study does not highlight all s in Norwegian military structure and action. It is thus difficult to generalize study findings, but some hints can be noted. First, developments in missile technology and long-range conventional cross-missiles that an actor who enters a fortified theater must Go to significant steps to clarify the area of surface landing. This may speak for long-range precision weapons also in the Norwegian structure, for example in the form of Tomahawk cross missiles. The submarine's domain is that Only not affected by missile development. This speaks for increased effort on submarines like the undisputed threshold weapon, equipped with long stretches precision weapons. Secondly, a military threshold must be visible. Ergo also wants surface units and airplanes play an important role. However, these must be upgraded significantly to follow the technological development, especially through better protection in order to could operate in a high-risk scenario. Thirdly, the increased weight of state
security will help to emphasize The significance of a state can demonstrate ability and willingness to protect its territorial integrity. The importance of a Norwegian navy that can help establish a credible naval threshold relative to Russia, speaking for one significant investment in further modernization of maritime capabilities and interact with fighters in the years to come.

**Further research**

This study has not addressed the continuation of the scenario of an article 5 situation. A subsequent study could therefore discuss such a development. The to explore what capacities allies in a thoughtful crisis situation can bring in the High North, could provide interesting perspectives. Russia is not the only nation that focuses on long-range missile systems in its defense strategy. China has a similar approach to denial in its neighborhoods like the Russian bastion defense. One could Therefore compare the scenario in this study with a similar case outside of China, to highlight the significance of cross-mercenaries in future conflicts. In general, it could also be interesting to investigate closer to the strong one increase in number of cross-missiles. One side of this could be to analyze what consequences this spread of cross-missiles might have for it free traffic on the ocean.
Abbreviations


Bibliography


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