



Decision time for ASW - Increased Cooperation to Prevent Irrelevance

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NATO is the most powerful military alliance in history. However, despite more than sixty years of successful cooperation, there is still potential to improve the Alliance. This is the case both in general and in particular warfare areas. This paper will discuss why Anti-Submarine Warfare (ASW) is important and how NATO can increase its ASW effectiveness in an age of declining defense budgets and pressure from other operational commitments.

First, history, geostrategic trends, and technological trends will be used to explain why ASW is important and why it will continue to increase in importance. Second, recommendations to a more efficient ASW will be laid out by looking closer at the current status of ASW capabilities in NATO, what the Alliance should aim for, and what the Alliance can do to get there. Third, potential

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counterarguments to the necessity, realism, and achievability of the recommended actions will be discussed. In conclusion, NATO should increase its focus on ASW and promote closer cooperation in order to maximize the ASW potential in the Alliance. This will ensure an ASW capability that is adapted to today's and future challenges.

WHY ASW IS IMPORTANT

Submarines are currently the only military platforms that can operate independently for long periods of time in areas dominated by the enemy. This makes them unique from a military perspective, both offensively and defensively. The number of submarine operating nations in the world is growing, and this will affect ASW. How this will affect ASW can be better understood by first looking at history, geostrategic, and technological trends.

Historic backdrop

During the Cold War, Soviet Strategic Ballistic Missile Submarines were considered to be one of the greatest naval threats to the Alliance.¹ ASW was consequently one of the most important warfare areas for NATO's maritime forces. The high number of Soviet submarines, combined with the combat potential of these platforms, led to a high focus and a dedicated effort to counter this threat. NATO achieved a high proficiency in ASW, particularly in the open oceans of the North Atlantic. Platforms, doctrine, and tactics were up to the challenge. However, when the Soviet Union collapsed in the early nineties, the submarine threat was significantly reduced. As a consequence, NATO's ASW capability started to erode. Despite several official efforts of increasing focus on ASW, the number of ASW platforms in the air, on the surface, and under the surface has been steadily declining. Today, more than two decades after the fall of the Soviet Union, NATO is at the point where there are arguably limited ASW assets even for low intensity operations in the classical European theatre. Capability is always difficult to assess, but a quick number comparison between contemporary ASW assets² and what was available only ten years ago³ shows a significant reduction.

Geostrategic trends

Nobody can precisely predict the future, but we can gain a lot of insight into potential scenarios by looking at some key developments.⁴ First, there is a gradual shift of global power towards Asia. This leads to a build-up of militaries in that region. Asia's spending on defense is set to overtake Europe's this year⁵, and countries like China and India have double digit increase in their defense spending. Some would call this an arms race. Others will argue it is just a natural development. Anyhow, the number of submarine operating nations in Asia is increasing, and the number of modern, advanced submarines is rising fast. Vietnam is buying six Russian built Kilo-class submarines.⁶ Thailand wants to procure submarines. Singapore, Malaysia, and Indonesia are already in the club. Australia is planning to double its submarine fleet in the 2020s.⁷ Japan and South Korea are increasing their submarine fleets, and China is definitely modernizing its.⁸ North Korea continues to focus on smaller submarines, and sank a South Korean Warship in 2010 in a torpedo attack.⁹ Submarines are currently on top of the wish list in South-East Asia. The power dynamics are changing quickly, and the growing importance of submarines in the maritime domain is apparent.

Second, Russia is resurging. The country is not currently a direct threat, but Russia is certainly back on the international stage as a significant regional power that sometimes has conflicting interests

with the West.¹⁰ Russia has maritime ambitions, and its national maritime doctrine focuses on “strengthening its position among the leading maritime nations.”¹¹ Submarines continue to be the backbone of the Russian navy.¹² They have launched several new classes of submarines over the last few years¹³, and their fleet of nuclear submarines has historically been their navy’s top priority. Strategic missile submarines and multi-purpose submarines continue to be the highest priority for the navy.¹⁴ With the second most powerful submarine fleet in the world, and as a major exporter of submarines, Russia continues to pose challenges for Western military planners that cannot be disregarded. Third, border and resource disputes in the maritime domain are heating up several places from Asia to the South Atlantic.¹⁵ The development of ocean resources is increasingly important for the economy of coastal nations with oil, gas, fishing and, in the future, seabed mining for minerals as key activities. Most of this activity takes place in the so called littorals, the coastal zone stretching from land out to sea to where the continental shelf drops off. With an increasing number of people on the planet and an ever increasing pressure on the available resources, tension is likely. Competition is increasing with many countries trying to secure resources on other continents, for example in Africa. The maritime environment is vital to global trade, and sea lines of communications (SLOCs) are getting more and more populated. There are several areas of maritime disputes, for instance the South China Sea,¹⁶ where many nations have overlapping claims.¹⁷ Even though this particular area is far away from the area of operations of NATO, it cannot be disregarded that the future will see more naval operations in Asia. The counter piracy operations in the Gulf of Aden and the Indian Ocean were not on NATO planning boards ten years ago. Now it is a major area of operations.

Finally, the oceans are the main commercial and information highway of the world. The volume of goods and information passing through them are increasing by the day. More than ninety percent of the world’s commerce travels on ships.¹⁸ Large parts of this are going to the US and Europe, and it is of vital interest to the Alliance to keep the SLOCs open. Another vital part of the global economy is our communications networks. Internet and other means of modern communications are transforming our societies and our economies. The vast majority of international communications travels via underwater fiber-optic cables.¹⁹ The voice, data, and video communications travelling through them are an extremely important part of the modern global communication infrastructure that ties us together. These cables are vulnerable and disruptions could have severe consequences. With ever more capable submarines benefiting from precision navigation and state-of-the-art sensors and weapons, surprise operations or attacks against this type of infrastructure should be a concern.

Technological trends

The world’s oceans cover two thirds of the planet. Yet despite all technological progress, we still cannot see through water with our technology the way we can see through air. The oceans are not transparent, and there is no technology around that is expected to alter this dramatically in the foreseeable future. Many technologies can successfully assist in finding submarines, but there is no panacea that gives total control of vast underwater areas. Compared to the air and the surface where the combination of ever more capable sensors and information technology make the battlefield transparent, the depths of the world’s oceans and littorals present numerous areas to operate freely and undetected.

Secondly, submarines are getting increasingly more stealthy and capable. The introduction of Air Independent Propulsion (AIP) has been a game changer for conventional submarines by giving them significantly increased stealth and endurance.²⁰ Furthermore, sensor and weapon ranges are increasing.

Firing control systems and C2I systems are also improving in performance. A small number of submarines can have a significant impact on operations in terms of working as an area denial system. Just the uncertainty about the presence and whereabouts of the submarines will create challenges. For sea denial or anti-access operations, the submarine provides mobility, flexibility, and endurance. It also acts as a force multiplier. During the Falklands War, one single Argentine submarine kept the British Task Group under pressure for one and a half months. The Royal Navy unsuccessfully expended more than one hundred anti-submarine torpedoes against what they believed was the enemy submarine, the San Luis.²¹

Thirdly, military capabilities that have asymmetric effects are very attractive. In maritime terms, systems that can provide anti-access or area denial capabilities will continue to proliferate.²² Submarines fit perfectly into concepts for anti-access and area denial (A2/AD).²³ Analyses of past maritime conflicts, combined with the knowledge of the challenges faced by Western militaries against asymmetric threats in Afghanistan and Iraq, have led some nations to focus on various asymmetric assets.²⁴ In the maritime domain, submarines and mines make up a central part of such strategies. Submarines are considered to be an excellent sea denial weapon of choice. They are proven, cost efficient, robust, stealthy, and lethal. Submarines are sought by both great powers, such as China and India, as well as smaller states, so called “maritime underdogs.”²⁵ Conventional submarines are “the weapon of the weak against the strong”²⁶ and will continue to be attractive. Submarines have played a significant role in all wars between maritime powers since WWI and must be expected to continue to do so in future conflicts.

Furthermore, the littorals are getting more and more important for naval military operations.²⁷ There is an abundance of factors ranging from underwater topography and water conditions to background noise, currents, and weather conditions that create an ever changing, complex environment in the littorals that can vary significantly from day to day and make ASW challenging.²⁸ This can be exploited by potential adversaries. They might use the environment to their advantage and NATO must be prepared to effectively combat submarines just as efficiently in the littorals as in blue water.

Finally, nuclear powers such as India, China, Pakistan, and Israel will probably follow the path of Western nuclear powers and place a greater part of their nuclear weapons on submarines in order to achieve a credible retaliatory force.²⁹ Current building programs and the focus of these nations on submarines give clear hints in this direction.³⁰ Even though a nuclear war is highly unlikely, it is worth emphasizing that one single strategic ballistic missile carrying submarine (SSBN) carries a larger yield than the combined explosive power of all the bombs used in the Second World War. The combination of increasing number of submarines and an increasing spread of nuclear weapons on various nations’ submarines leads to a more complex security environment. And if a wider spread of nuclear weapons on submarines is not enough, submarines are getting increasingly capable across the board. A submarine typically carries somewhere between eight to sixteen torpedoes, and it only takes one to sink a ship. Submarines are also increasingly able to conduct precision strikes on targets on land. In the future, they will be able to conduct attacks against airborne assets, and the potential payloads of various unmanned vehicles remain to be seen.

HOW NATO CAN IMPROVE ITS ASW CAPABILITY

Stronger together against common threats and challenges

The NATO Secretary General warned in a speech in July 2011, “The influence and leadership of Europe on the international stage will decline if defence cuts continue.”³¹ The economic challenges that currently face Europe are serious. As a consequence, government spending, including defense spending, will be cut in most European countries. On the other side of the Atlantic, the US and Canada also face budget challenges. Even though Europe in itself is seen as relatively free of imminent danger, the recent operations in Libya, the ongoing civil war in Syria, the Iranian nuclear programme, and tensions in Asia should serve as a reminder that the potential for conflict is all but gone. The Alliance needs to be prepared for all types of contingencies. In the contemporary world, fighting together, whether this is as part of an alliance or as part of a coalition, seems to be the way of the future. In most areas, NATO members continue to have the same security interests, and the EUCOM slogan “Stronger Together”³² certainly holds true.

In an ever more interconnected, interdependent and globalized world, NATO members face common threats and challenges. It is unlikely that a NATO member will be attacked by an outside enemy that is not also an enemy to other member countries. Almost all Western military operations after the Cold War have been coalition based. NATO still remains unchallenged in the air and at sea, but countries have been cutting their forces. With the notable exception of the U.S., no other NATO member is capable of sustaining large, deployable ASW forces. Europeans should therefore pursue even closer naval partnerships in order to ensure that they maintain the capability for full spectrum naval operations together. NATO’s Secretary General also argued in July that Europe should pursue a “smart defense approach”³³ by working together and being more flexible. Faced with a world that is rapidly changing and where an increasing number of nations are able to operate a range of sophisticated submarines, NATO has to cope with that accordingly. This includes conduct of full spectrum, large scale ASW operations both near and far.

Starting point – Current status of ASW-capabilities

Warships, submarines and Maritime Patrol Aircraft (MPA) are all important for an effective ASW capability. Various ISR assets also complement their effort. However, some of the ASW capabilities in NATO are at a bare minimum. The UK scrapped all their Nimrod MPAs with a pen stroke during the 2010 Strategic Defence and Security Review (SDSR).³⁴ The British were not the first to cut their MPAs. Today, very few NATO members still operate MPAs. The number of submarines and ASW ships in NATO has also been in steady decline. Although the platforms are modern, high tech and very capable, a few state-of-the-art, multi-mission platforms cannot do the job alone. Quality is important, but quantity also matters. Furthermore, various operational commitments such as counter-piracy is taking the focus and training time away from traditional war fighting capabilities such as ASW. It is also important to acknowledge that the situational awareness the Alliance enjoys in peacetime will most likely be significantly degraded in times of conflict or war. Many of the ISR systems that NATO relies on for their situational awareness and decision making will make tempting targets for adversaries. In peacetime, ASW is very much an intelligence driven game. In the fog and friction of war, naval assets will have to do the majority of the work.

Destination –Ambition level

To win a war is great. To defeat an enemy without fighting is even better.³⁵ NATO is the most successful defense alliance in history. It is not perfect, but it definitely served its purpose during the Cold War and in its aftermath. However, NATO must continuously work to maintain the success of the Alliance and prepare for future challenges. In maritime, ASW terms, this means that NATO must be able to deter and defeat any potential aggression against the Alliance from submarines. An alliance with a high proficiency in ASW will deter potential aggressors and render their underwater platforms less efficient. Cooperation is not the only way to ensure success, but it is certainly one of the smartest and most affordable ways to get there.

The current maritime strategy of NATO focuses on deterrence and collective defense, crisis management, cooperative security, and maritime security.³⁶ NATO sees the need for further transformation and has identified several focus areas. While it is difficult to find any specifics on ASW in unclassified documents, the key focus areas clearly apply to ASW. A credible ASW force will act as a deterrent against, and limit the impact of, enemy use of submarines. NATO must be capable of controlling SLOCs and preserve the freedom of navigation. This requires a rapidly deployable and capable force that master ASW both in blue water and in the littorals, from cold Arctic waters to tropical seas. Last but not least, credible and capable NATO forces engaging with partners contribute to conflict prevention.³⁷ Greater cooperation and increased training breeds experience which contributes to deterrence. NATO must ensure that their ASW effectiveness is high enough and that partners can easily combine for concerted effort and action if required.

Roadmap –Recommendations for improvement in ASW

Despite all the successful cooperation that is taking place within NATO, interoperability and communication is still a challenge. For instance, there are numerous differences between the various nations' platforms and equipment. NATO members have to work with the equipment at hand, but the minimal level of ASW proficiency currently maintained by the Alliance will not be sufficient in the future. Fortunately, there are ways to bridge the gap.

First of all, closer cooperation is necessary in order to maximize the potential of NATO's assets. This applies to air, surface, subsurface and ISR assets in the Alliance. The Alliance's total ASW capability is unchallenged, but could be improved even further, for example in the field of information sharing. Information sharing systems such as CENTRIX³⁸ allows for information sharing and joint planning between allies at a relatively low cost. Also, the system is quick and simple to install, and it has a user interface that requires minimal training.

In general, NATO still has a significant potential for increasing the sharing of real time information in the maritime domain, both between HQs and between individual units. In some areas, NATO has been able to pool resources within the Alliance. NATO's AWACS is probably the most successful cooperative project with 18 participating nations.³⁹ Joint Electronic Warfare is another example.⁴⁰ ISR is an area with significant potential in that regard. A common fleet of MPAs should be considered closely when future procurement is planned. Satellite surveillance, coastal radar surveillance, drone coverage and other future ISR assets should also be joint ventures where more nations contribute in order to develop an even better Maritime Situational Awareness (MSA).

Secondly, NATO should increase focus on ASW in general and littoral ASW in particular. The reductions in assets and reduced training levels have led to an overall reduction in capability. This trend must be reversed. ASW proficiency only comes with routine and regular exposure to real submarines. More training is needed, both in quantity and in quality, and especially against submarines in the littorals. This is the most challenging area to conduct ASW, and it is also the most likely area for future maritime conflicts. Structured events in exercises are necessary to facilitate familiarization between ASW assets and submarines and to ensure sufficient in-contact-time, but free play events are vital to bring realism into play.

Thirdly, increased interoperability, improved procedures, and better communication systems have the potential to make ASW assets more efficient. There are still some minor differences between US and NATO procedures for ASW that need alignment. There should also be solutions for how to quickly integrate non-NATO members in ASW operations. Furthermore, high priority should be given to also include them in training and exercises in order to gain experience, increase interoperability and bridge the gaps. Enhancements include use of “fly away kits” for communications and crypto and specially trained ASW liaison officers. Combining this with simpler procedures could help to facilitate concepts involving other partners. In addition, simpler and quicker systems for sharing ASW experiences would contribute to spreading knowledge and facilitate tactical development. Keeping systems simple and user-friendly ensure that they will actually be used on a regular basis in sharp contrast to some of the complicated, very detailed databases currently in use.

Furthermore, NATO should promote and support initiatives leading to a “smarter defense” – that is, more “bang for the buck.” A 2011 report⁴¹ from the Center for Strategic & International Studies stated that Europe gets less capability from their defense spending than the U.S. There has been an ever more costly spiral in defense procurement that needs to be properly addressed. Investments should increasingly shift away from domestic manufacturers to whoever provides the best value with regards to cost, quality, and production time. Former U.S. Secretary of Defense, Robert Gates, commented in a 2009 speech at the Air War College that “...we need to shift away from the 99 percent “exquisite” service centric platforms that are so costly and complex that they take forever to build and only then in very limited quantities. With the pace of technological and geopolitical change, and the rate of possible contingencies, we must look more to the 80 percent multi-service solutions that can be produced on time, budget, and in significant number.”⁴² A mix of multi-mission capable platforms and some simpler, cheaper, less capable designs can help maintain the necessary quantity of platforms while breaking the spiralling cost cycle. It is the total capability that matters, not the individual components. With several nations having to reinvest in new platforms over the next decade, the time is ripe for multinational procurement cooperation. Cooperation can contribute to realizing capabilities that would not be economically viable for the individual nations on their own. Furthermore, it can achieve economies of scale that increase the total value for each participating nation through providing more defence for the money spent.

Emerging technologies should be exploited vigorously. For ASW, a combination of new unmanned systems such as Unmanned Underwater Vehicles (UUV), gliders, Unmanned Surface Vehicles (USV), Unmanned Aerial Vehicles (UAV), as well as stationary underwater sensors and free floating devices, have created the potential for new concepts, doctrines, and tactics. All of the systems mentioned above have the potential to bring quantity into ASW with relatively low cost, especially on the sensor side of it. Taking into account today’s capabilities, these assets will eventually assist in detecting submarines and also create an ambiguity that challenges the submarine and potentially limits

its freedom of action. Low-cost sensors operating in networks – or autonomously – that are quick to deploy and quick to retrieve can cover large areas at minimal risk. Compared to the risk and cost of putting large, complex, costly warships in harm's way to achieve detection, the way forward seems to be to go small and unmanned. The biggest challenge with unmanned vehicles in ASW at this stage is the weapon load. Torpedoes are the primary weapon to effectively combat a submarine, but torpedoes have a high weight, take up room, and are not ideally suited to small unmanned platforms. Concept should therefore make use of such new systems to increase the sensor density and coverage in an operations area to detect hostile submarines. Once detection is made, more capable assets can be vectored in.

ASW tactics is an area that has had little real development since the end of the Cold War. A lot of experimental tactics have delivered promising results, but the way from experimentation to approved tactics in NATO is slow. Nevertheless, NATO must prepare for future threats. Close protection of high value units combined with other high value units pose some challenges. As long as the cost and the military value of traditional escort vessels are as high as today, tactics must be reconsidered to reduce risk and increase mission success. Protection of SLOCs will always be important, but there might be better, more efficient and less risky ways to do this. Various ways of degrading the submarines situational awareness should be exploited in new tactics for deterring, disrupting and preventing submarines from mission success. NATO should aggressively experiment with both deter and detect tactics and more quickly approve and implement new tactics and procedures.

Finally, NATO needs to be flexible and develop a concept for how the Alliance can surge its ASW capability if required to account for the unexpected. A rather visionary “surge concept” could consist of “clip on sensors,” that is sonars and other ASW sensors that can be quickly mounted and used on available commercial ships for submarine search. Suitable shipping for such concepts have to be investigated more closely, but modern seismic ships, modern industrial trawlers and smaller, modern merchant ships are potential platforms. Mine Counter Measure (MCM) vessels could also have a potential role in littoral ASW, primarily for deploying sensors, but also in streaming smaller versions of “clip on” sonars. This potential should be investigated further. In addition, rapidly deployable sensor fields could be used to close an approach axis or as “gap fillers” to augment the search effort in an area. Such sensors would primarily be for underwater use, but sensors for use on land close to choke points and other areas where there is a high probability for submarine operations should also be investigated. Potential “land sensors” could be infra red and electro-optical systems as well as small portable radars – primarily civilian equipment bought off the shelf and modified as necessary. Integrating Civilian off the Shelf (COTS) technology and military technology for cheap and smart solutions could provide the required additional “quantity” to more successfully cover areas that normally would require a large number of multi-mission capable warships or MPAs.⁴³

POTENTIAL COUNTERARGUMENTS

The U.S. “Cooperative Strategy for 21st Century Seapower”⁴⁴ focuses on opportunities and optimism. The current economic crisis could be the necessary catalyst to push through the policies that will enable greater cooperation across NATO. Change in our militaries is inevitable. The challenge is to make it into an opportunity and not a threat. ASW is a challenge, and it will increase in importance in the future. Now is the time to refocus on it and use the time and resources wisely to ensure a highly capable ASW force for the future.

Some people might argue that other warfare areas such as Anti-Air Warfare (AAW) and Ballistic Missile Defense (BMD) are more important than ASW. AAW, BMD, and other warfare areas are as important as ASW. NATO has to master all warfare areas, but should be careful not to forget history and basic principles of wars. Submarines played a huge role in two world wars and had a very high priority for both sides during the Cold War. After two decades of limited maritime threat to NATO, it is important to look ahead and prepare for future challenges. NATO members are good in ASW, but the skills are diminishing. There is much more potential to take out and it is each nation's responsibility to do so. Even though reduced budgets might result in less training and investment, NATO should strive to improve its ASW combat potential.

The last three decades have not seen any major combat action at sea involving ASW. In today's world, counter piracy, counter trafficking and other contemporary missions are high on the agenda. Nevertheless, if the Alliance slips into a conflict with nations that possess submarines, ASW will play an important role. Weaknesses of forces might be exploited by a potential opponent. Strengths of allied forces will act as deterrence.

Increased cooperation and the resulting increased mutual dependence will reduce the individual nations' freedom of action, and they will have to rely more on each other. While some people might consider this to be a net negative, a relevant question to ask is whether there is any credible alternative. Our economies, labour markets, production, trade, research, counter crime, militaries, and international policies are getting more and more intertwined. This increased cooperation and interdependency is one of the key drivers of the enormous growth and technological progress we have seen over the last decades. It would be counterproductive not to reap the same rewards in defense as we are doing in most other areas. For nations that share the same values, challenges, and threats, ASW is just another one of the areas where we should move ahead to capitalize on its full potential. It is necessary, and it is also realistic and achievable.

CONCLUSION

The oceans are not transparent and submarines will continue to be difficult to find. Submarines are stealthy, have long endurance, and normally enjoy the element of surprise when they attack. Their effect is truly asymmetric. Their military utility is proven for more than a hundred years, and current trends indicate an increased investment in and proliferation of advanced submarine technology. Geostrategic and technological trends point in the direction of an increased submarine threat in the littorals, especially in Asia. With the increased trade and interdependency comes the increased vulnerability to temporary shut downs of global sea lines of communications, both for commerce and for modern communications. Even though NATO currently does not face an immediate threat involving submarines, future maritime conflicts will most likely include a significant submarine threat. NATO must be prepared for this. Common interest, threats, and economic challenges have the potential to create an opportunity to improve NATO's ASW efficiency.

ASW should be a key focus of the maritime forces in the Alliance. NATO should maximize the potential of the current forces and closely investigate the potential for increasing the Alliance's ASW capability. It will require increased cooperation, increased focus on ASW, improved communications and interoperability, development and exploitation of new technologies, development of new tactics, and development of a concept for surging ASW. A proactive and forward leaning approach is necessary to prepare for future challenges. Ultimately, cooperation is the most realistic and achievable way of

maintaining and sustaining a credible ASW force. It will be challenging, but in order to successfully counter current and future ASW threats, NATO needs to take the ASW cooperation to the next level.

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