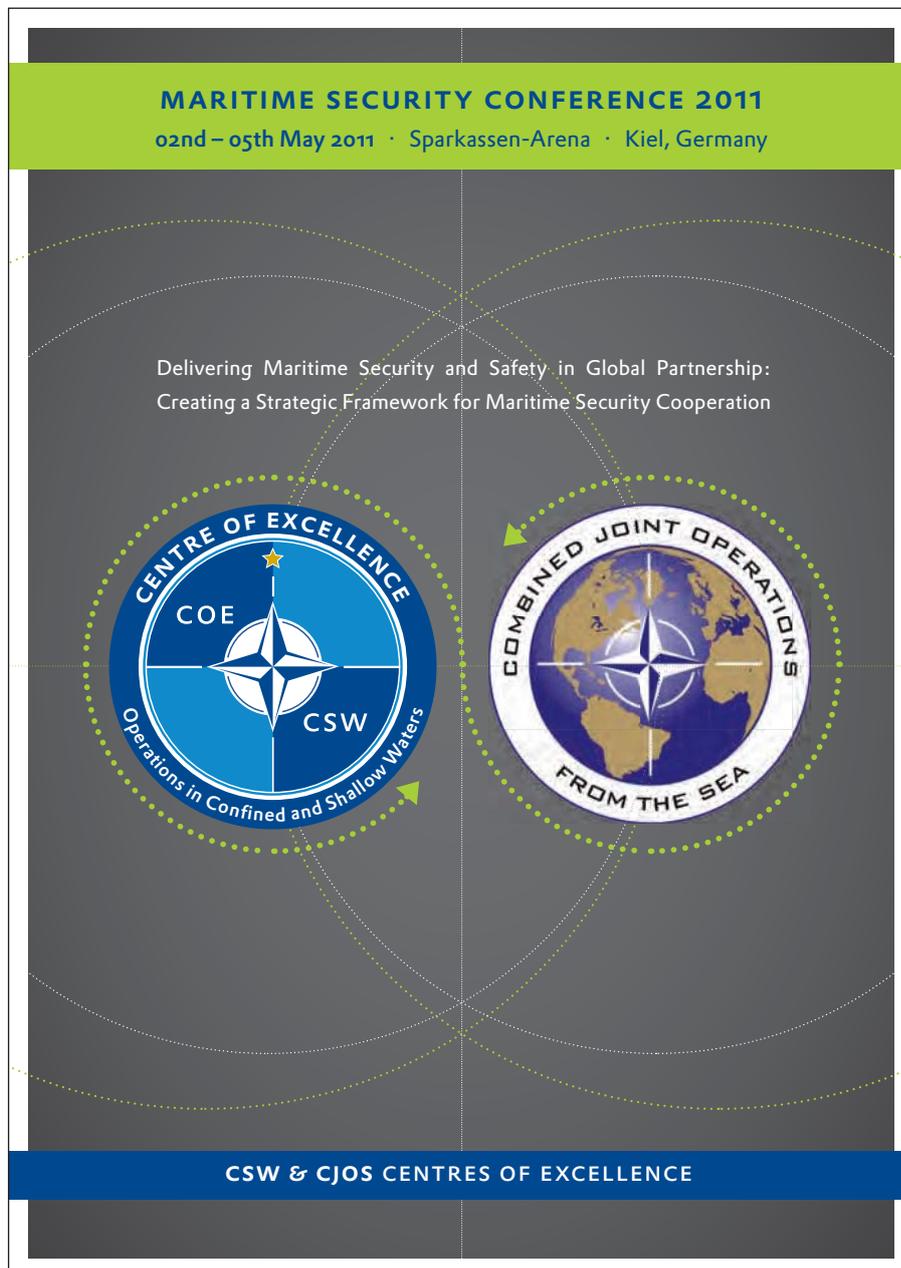




Centre of Excellence for
Operations in Confined and Shallow Waters

Maritime Security Conference 2011 Proceedings



Kiel
2011

**Centre of Excellence
for
Operations
In
Confined and Shallow Waters**

Proceedings Report

First Combined COE CSW / CJOS COE

Maritime Security Conference 2011

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First Combined COE CSW / CJOS COE Maritime Security Conference 2011 – Proceedings

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MSC 2011: Conference Analysis and Way Ahead

General

The first Combined Maritime Security Conference under the theme of "*Delivering Maritime Security in Global Partnership: Creating a Strategic Framework for Maritime Security Cooperation*" was held in close cooperation between the Centre of Excellence for Operations in Confined and Shallow Waters (COE CSW) and the Combined Joint Operations from the Sea Centre of Excellence (CJOS COE) at the Sparkassen Conference Centre in Kiel, Germany from 2 to 5 May 2011.

Within the context of this theme, the participants examined how international organizations and emerging regional maritime security cooperatives could collaborate more efficiently to form an enhanced framework for maritime security cooperation and awareness. The overarching aim was to examine how international organizations and emerging regional maritime security organizations could collaborate together to form a "Global Network for Maritime Security Cooperation and Awareness".

The conference provided an exceptional networking platform. Nearly two hundred participants from 26 nations, i.e. experts of academia, industry, Coast Guards and other governmental organizations (GO), non-governmental organizations (NGO), regional and local security organizations discussed maritime security issues and provided relevant recommendations.

Together these experts examined the essential requirements and activities required to achieve, enhance and coordinate maritime security through global cooperation. This conference was aimed to align our efforts, develop greater understanding of the many facets contributing to maritime security and produce tangible results and identify short- and long-term goals which will lead to closer collaboration between regional maritime security organizations.

As the conference was organized and held in close cooperation between COE CSW and CJOS COE, it would only be logical and wise from our point of view to make every effort to tie these loose ends together and cement the tie between them through continued cooperation. The expertise of other COEs can also be helpful and they are invited to work with us towards reaching this goal. COEs are unique entities that have the capabilities needed to tackle this challenge. As multinational military organizations, they have access to the best practices, operational capabilities and emerging concepts of participating nations, providing an already existing pro-active form of information sharing. This can be used as an enabling capability to bring forward the recommendations and actions from the panels.

Panel Work

During the panel sessions, participants were informed and given the opportunity to discuss the challenges faced by the international community in promoting global maritime security. It became obvious that there is a wide spectrum of issues showing that there is much more work yet to be done in order to achieve international unanimity leading to coherent governance policies and standards for cooperation and information sharing.

In order to summarize that spectrum, each panel was tasked to provide a wrap-up presentation comprising key points, issues and concerns, recommendations, and action items. A summary of these presentations is provided in Annex A. The recommendations submitted provide an excellent roadmap to focus efforts in progressing future conference initiatives with the collaborative expertise of the COEs. Many of the recommendations and action items stemming from MSC 2011 will be carried forward at future conferences and other activities such as the Multinational Experiment 7 (MNE 7).

As the COEs do not have unlimited resources, it is necessary to analyse the panel recommendations and determine where the resources can best be used. A number of the initiatives COEs intend to bring forward based on the outcome presentations are outlined in this paper. Most of these initiatives have already been *done* and some others are under review by the COEs or other institutions.

The first obvious result of the analysis of the panel outcomes was the recurring theme of community of interest. All four panels spoke in one way or the other of a broader community that works together to enhance maritime security:

- the Governance Panel used the term “participative strategy”;
- the Legal Panel stated “let’s actually practice a Comprehensive Approach”;
- the Surveillance Panel advocated the concept of regional organizations acting as catalysts for intra-state and inter-agency co-operation; and
- the Data Sharing Panel put forth the concept of creating an international community of interest.

All of these recommendations are getting to the same point in different ways. We all need to work together towards the goal, and here the word “all” indeed means all of the stakeholders and interested parties, many of which attended the conference. However, there are many more that can be brought into the community suggested here.

This implies a logical first step. Unless the major part of the community works on a common strategic vision to achieve global maritime security, the challenges of differing policies and standards will be counterproductive to efficiency realization. The second issue reveals a lack of understanding between different cultures - many elements are resistant to any change. This resistance may not necessarily stem from disagreement with the ideas, but may merely arise from lack of consultation or for other political and strategic reasons.

The three maritime COEs (COE CSW, CJOS COE and Naval Mine Warfare COE) can assist in forming a catalyst to engage and lead a larger community of willing partners to establish a global partnership for the benefit of all. The first and easiest way of building up this community is to invite a broader scope of organizations to attend the next conference. MSC 2011 was very well supported by participation of high-level decision makers representing the military and civilian communities. Additionally key academics in the field of

Global Maritime Security and industry representatives provided a disciplined analysis of the issues affecting international relations and diplomacy. Whilst the attendance was exceptional, there is always room for improvement. Greater representation from the law enforcement agencies (national and international), NGOs, IO and regional maritime security organizations would be a tangible step forward towards the “greater community” advocated by all of the panels.

The integration of expertise into the maritime COEs can lead to extensive knowledge and know-how fuelling the intellectual power to address the complex issues facing maritime security. However, the COEs cannot work in isolation. In today’s global community, a multitude of threats with the potential to affect a larger and more diverse impact on our quality of life than ever perceived can only be countered by a true comprehensive approach. The maritime COEs will continue to work closely together and we will strive to align a coherent set of doctrinal approaches through common vision and unity of effort. Future cooperation with other COEs such as the Civil-Military Cooperation COE (CIMIC), Command and Control COE (C2), Cooperative Cyber Defence COE (CCD), Defence Against Terrorism COE (DAT), Military Police COE (MP) and NATO Maritime Interdiction Operations Training Centre (NMIOTC) can significantly contribute to global maritime security.

One of the key take-aways highlighted at the end of MSC 2011 was the need for strategic vision and political will to make global cooperation a real enabler for maritime security. A lead nation or group of like-minded nations could support a resolution to enable an international authority to coordinate the protocols and process leading to more efficient and cost effective maritime security operations. COEs together with Allied Command Transformation (ACT) can focus the work and align the efforts in the right direction in order to achieve greater and better cooperation in global maritime security.

Findings and Programme of Work

The Programmes of Work (PoW) of both the COE CSW and the CJOS COE contain projects that are directly related to the panel findings. The COE CSW projects headlined “Deployable Maritime Situational Awareness (MSA)” and “Detection of Unmanned Underwater Vehicles” are both addressing a number of panel recommendations, specifically the issues of practical information sharing, awareness of maritime domain and underwater and deep sea situational awareness raised by the Surveillance Panel. The CJOS COE’s experimental tactical publication addressing maritime piracy security challenges (currently being used by NATO off Somalia) and the Allied Interoperability Handbook aimed at improving interoperability between the Alliance and Coalition partners are good examples of what the Legal Panel cited as a requirement to extend participation and exchanges and address real world multinational operational issues.

An emerging item on the COE CSW PoW is the “MSA and Maritime Control in CSW” project being developed in close cooperation with the Finnish Navy. The aim is to conduct a new basic study on how to conceptually approach future MSA and develop an operational concept and operational requirements to improve situational awareness and the control of the CSW environment. There are close links between this effort and the “Deployable MSA Component” project; however, this broader effort encompasses even more panel outcomes.

Conference Goal

Did we manage to meet the explicitly stated conference goal of creating a strategic framework for maritime security cooperation? CJOS COE's think piece presented under the title of "*A Framework for Enhanced International Maritime Security Cooperation*" provides a framework we all could use as a starting point. This paper was subject to refinement after the conference and hence the conference goal can be considered met. However, this goal is multifaceted, immensely complex and has many aspects. The COEs will therefore continue to tackle the problem by implementing their PoWs and broadening their networks. It must be the aim to continue to work together in order to achieve reliable and more mature results for the future. Unity of effort, not unity of command, is what we should aim at.

Way Ahead

As the practical way ahead, we intend to continue and enhance the cooperation of maritime COEs and expand the COE community to include others with a stake in global maritime security. We will start to broaden the pool of invitees to next year's conference to include more stakeholders and interested parties. We will continue to support multinational, multi-agency exercises and experiments. In short, we will strive to be an International Community of Interest (ICOI) in global maritime security.

From this general way ahead, we have identified some short-term goals. At first, we will increase the cooperation with the maritime COEs to gain more efficiency and effectiveness for our sponsors. In practice, this means we will require frequent communication of our Programme of Work items in order to identify overlapping projects. The COEs can share and build on their processes and methodologies to achieve high-quality results. Still we need to find further opportunities to identify more areas for cooperation such as the Maritime Security Conference series.

Secondly, we will broaden the pool of invitees to the next year's conference. When identifying the target audience for MSC 2012, we will have a special focus on inviting NGOs, academia and industry to Halifax. The first steps in this effort have already been taken. The COEs are working on the 2012 Maritime Security Conference in close partnership with Dalhousie University in Halifax.

Thirdly, COE CSW will participate actively in the Multinational Experiment 7, "*Access to the Global Commons*". The title clearly states what this experiment is about, and if there was any doubt to the applicability to global maritime security, the stated objective to "*Develop a framework for the establishment of comprehensive regional and interregional maritime security regimes in order to ensure access to and freedom of action within the Maritime Global Commons Domain*" should remove any uncertainty. The common intent is to develop an innovative framework, including principles, processes and tools, for the establishment of future regional and inter-regional Maritime Security Regimes as well as the enhancement of them. The planned products in the MNE 7 maritime domain are a concept paper and a handbook. A Maritime Security Regime concept paper "*will provide fresh and innovative ideas to a broad audience (not just military) on how to improve our ability to build or enhance maritime security regimes in order to ensure access to and freedom of*

action within the maritime global commons domain". Follow-on to the concept will be a Maritime Security Regime handbook which "will implement concept ideas in a useful product for the maritime community". COE CSW has offered to take the lead in writing the handbook. This needs still to be confirmed by the Experiment Lead of MNE 7's Maritime Domain. However, this cannot be done properly without utilizing the expertise of the greater maritime community.

As a longer-term goal, COEs have to ensure that the PoWs and delivered products continue to reflect the true needs of the global maritime community.

In this year's conference we discussed under the theme of "Creating a Strategic Framework for Maritime Security Cooperation". Based on our findings from MSC 2011, a logical step to move on and a way ahead is to start to identify practical strategies and ways to work in Maritime Security Cooperation and also to be more future oriented and start to discuss the trends and emerging threats in the Maritime Security domain. Clearly we need to elaborate the governance issue from national and inter-regional perspectives. This is not a step back; we have to have the right viewpoint in order to bring to the table the idea of the Global Partnership. Further on, since the developments from science and technology are providing us a constant flow of new complex systems and applications, we need to address the technical capabilities and standards. Finally we have to address the future developments. Nobody can predict the future, but we can tell something about the trends and likelihoods. This discussion is very much needed in the light of the decreasing budgets.

Last but not least, we need those that attended the conference, as well as the greater maritime community, to work with the COEs to provide their views and desires and to help us identify potential issues and solutions. In this endeavour, progress needs participation. We request your support to keep the momentum and move this initiative forward toward the goal of enhanced maritime security.

Annex A: Main Findings from the MSC 2011 Panel Work

1 Governance

Key Points	Action Items
<ul style="list-style-type: none"> • <u>Political will</u> is a key driving factor in establishing maritime security governance • Reaching an "understanding of understandings not our own" is necessary to <u>reduce cultural barriers</u> to maritime security governance. Must build consent and consensus on concepts, roles, responsibilities and incentives • "<u>Governance</u>" requires significantly different approaches at global, regional and domestic levels 	<ul style="list-style-type: none"> • Identify key stakeholders in maritime security and derive common interests • Identify maritime security aspects of national and strategic issues/concepts • Incorporate maritime security governance objectives into key exercises (MNE7)

2 Consolidated Legal Strategies

Key Points	Action Items
<ul style="list-style-type: none"> • Sufficient international <u>legal framework</u> exists <ul style="list-style-type: none"> ○ for information sharing, for prosecuting crimes (e.g. piracy) ○ We do not need more legal instruments ○ We need nations to use the existing tools to ACT ○ If a lawyer says “you can’t do it”, ask another lawyer until you find one who says “<u>you can</u>”! • New risks and “old?” laws: [<i>Who is the owner of/responsible for the <u>emerging issues</u>?</i>] <ul style="list-style-type: none"> ○ Marine mineral resources ○ Accidents & natural disasters (Gulf Spill, Fukushima) ○ Climate change / sea level rise ○ Communication security (SLOCs, cable, pipelines) 	<ul style="list-style-type: none"> • Now it is time for action - no more “Groundhog Days” • Create a system and a way to exchange information between sea service, law enforcement organizations and commercial entities • Task and report back on progress at next MSC 2012 conference (Halifax)

3 Surveillance

Key Points	Action Items
<ul style="list-style-type: none"> • <u>Complexity of marine environment</u> will increase rather than diminish, owing to novel ways to exploit maritime resources (habitats, the NE and NW passages, waterways, etc.) • Maritime security problems are not different all over the world. Piracy, smuggling, terrorism, human trafficking <u>appears everywhere - and affects everybody</u>, not just the neighborhood. • Technology is not a problem; we already own the necessary elements. We need <u>political awareness and decision</u>. 	<ul style="list-style-type: none"> • Increase public awareness of the importance of the maritime domain for all aspects of human life • Use regional organizations (SUCBAS, MARSUNO, etc.) not only to increase coverage, but also to help break down sectorial barriers. Eventually merge them to achieve global coverage. • Study possibilities to use private means (fishermen, yachtsmen, etc.) to detect anomalies

4 Data Sharing Technologies and Infrastructure

Key Points	Action Items
<ul style="list-style-type: none"> • <u>Non-competing</u> EU/NATO efforts synchronized with national efforts 	<ul style="list-style-type: none"> • Meet with key stakeholders, regional center leads • Create an international maritime community of interest and determine info sharing requirements (what and how) • Create tools/applications to share and collaborate

Coordination and Cooperation among States and Inter Agencies in the Arabian Sea Region

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Introduction

Arabian Sea Region, inclusive of Arabian Gulf, Gulf of Oman and Gulf of Aden, is important from regional and global perspectives primarily for its vast energy reserves. The region is the source of over one third of the world's oil supply and can therefore be termed as the prime-mover for major economies of the world. Maritime waterways over the Arabian Sea serve as the major trade route between west Asia and rest of the world and thousands of ships traverse through the strategically important choke points of Strait of Hormuz, Bab-al-Mandab and the Suez Canal.

The region's security has been mired with inter-state disputes since long. However, over the past decade or so and, especially after the events of 9/11, the region has become the hub of transnational threat posed by non-state actors with its potential fallout in the maritime domain. The situation in Afghanistan, Somalia and elsewhere in the region is well known and needs no mention here. But very briefly one can say that the regional countries, to a large extent, have issues of poor governance, economic and political deprivation of masses, and social injustices etc. leading to favourable conditions for terrorist organizations. Additionally, the region's masses, many of whom comprise of Muslims, view the western countries following unjust policies, especially on the long festering disputes of Palestine and Kashmir. All these factors lead to a volatile and complex regional security matrix having serious implications for the safety of maritime trade routes in the region.

Although an effective and long lasting solution for dealing with threats to regional maritime security would be resolution of disputes and issues over land. In this regard one can say that the recent popular uprisings in the Arab world may, in the medium to long term, lead to regional stability. But until that happens, Maritime Security can be achieved to a reasonable extent through coordination and cooperation among regional states and inter-agencies with the support of world powers already engaged in the region.

The aim of this paper is to give my experiences and vision regarding the challenges in the regional maritime security domain and cooperation between various stake holders for a regional maritime security regime in the Arabian Sea region.

Maritime Environment and Security Challenges

Post 9/11 events leading to the current situation in Afghanistan and Pakistan's western tribal belt have plagued the region with instability. Other littoral countries of the region, notably Yemen and Somalia, have domestic disputes and governance issues leading to regional instability. The pressure created by the Pakistani and International Security Assistance Forces in Pakistan's tribal belt and Afghanistan respectively, has forced the miscreants, mainly Al Qaeda, to divert their activities elsewhere in the region, notably in Yemen.

Pakistan's coastline provides outlet to sea to the land locked Afghanistan. The largely unregulated coastlines of the littoral countries provide an opportunity to miscreants to exploit the maritime environment to further their cause through attacks, acquire funding through illicit activities and to covertly move weapons, explosives and personnel. The significance of the energy highway emanating from the Strait of Hormuz and Gulf of Oman means that any attack on shipping may have regional and global ramifications.

Several international terrorist organisations (ITO) operate in the region. While many of the ITOs have linkage to one another, the specific threat posed by each group depends on their individual intent and capabilities. None of the ITOs are known to have a true maritime operational or attack capability. Nevertheless, attacks on shipping using rudimentary means like explosive laden skiffs or dhows in restricted waters, choke points and anchorages are a possibility. Such types of attacks have been undertaken in the past mainly by Al Qaeda. In this regard one can give examples of the attacks on USS COLE in 2000 and MV LIMBURG in 2002 in Yemen, the failed attack on Iraqi oil terminals in 2004 in the Arabian Gulf and attack on Japanese oil tanker in 2010 in

the Strait of Hormuz.

Besides terrorism, there are other illicit activities such as the smuggling of weapons, drugs, oil, people and basic commodities, which are overlaid in the dynamic and varied shipping environment in the region. Narcotics trade is one of the major illicit activities, which reportedly is also a source of funding for ITOs and insurgents in Afghanistan. One of the fallouts of the war in Afghanistan has been that country becoming the major source of narcotics. A significant portion of the narcotics are transported via the maritime route through the Makran coast, spanning the coastline along the Pakistani and Iranian borders, to the north eastern coast of Yemen and east coast of Africa, and from there to other destinations.

Human smuggling is rampant in the region. These are mostly economic migrants who are smuggled mainly from Somalia and South Asian states to the countries of Arabian Peninsula. This trade has a humanitarian dimension as the people being smuggled at times are thrown overboard by the smugglers if approached by law enforcement agencies. Besides, these poor people quite often end up in miserable conditions in the destination countries.

Piracy is another illegal activity mainly emanating from the instability and lack of governance in Somalia that threatens thousands of merchant vessels passing through the Red Sea, Gulf of Aden and Somali Basin. Pirate Action Groups operating from mother vessels have attacked ships hundreds of miles away from the Somali coast. A nexus between pirates and maritime terrorism would be a dangerous proposition as it would provide terrorists the necessary wherewithal, in terms of skilled mariners, to threaten the international shipping. However, such a possibility appears dim as the objectives of maritime terrorism and piracy remain mutually exclusive. While piracy thrives on international shipping and trade, maritime terrorism seeks its extinction. From the review of maritime environment the primary contours of threat are as follows:

- a) Violent activities by miscreants against lawful mariners;
- b) Narcotics trade mainly originating from Afghanistan via the Makran coast to Yemen and East Africa;
- c) Smuggling / trafficking of humans, weapons, goods and commodities, and
- d) Piracy in the Gulf of Aden and Somali Basin extending to the Arabian Sea, Red Sea and the Indian Ocean.

Existing Regional Maritime Security Framework – Success and Weakness

The primary framework of regional maritime security in the Arabian Sea is provided by the Combined Maritime Forces, commonly known as the CMF, operating under the auspices of US Naval Central Command, headquartered at Bahrain. It is an international coalition of the willing having about two dozen member countries which provide ships, aircraft and headquarter staff. The member countries include a mix of regional and non-regional countries, with the latter comprising mostly of the western nations or their affiliates. The regional mix mostly comprises of the countries of Arabian Peninsula and Pakistan.

The objective of CMF is to maintain regional maritime security and defeat or disrupt violent extremists and terrorist networks use of the maritime environment. Its area of responsibility comprises international waters of Arabian Gulf, Gulf of Oman, North Arabian Sea, Gulf of Aden Somali Basin and the Red Sea, which is a huge area stretching over 2.5 million square miles. The CMF is commanded by the Commander US Naval Central command. The CMF achieves its aims through the three Combined Task Forces i.e. CTF-150, CTF-151 and CTF-152, each of which are commanded by member navies in turn.

CTF-150 is the oldest of the three task forces. It was established soon after the beginning of Operation Enduring Freedom in February 2002 with primary focus on counter-terrorism. It is responsible for the entire AOR of CMF except for the Arabian Gulf. Pakistan Navy is the only regional navy that has continuously provided ships for CTF-150 since 2004 and has routinely commanded it. CTF-152 was established in March 2004 and operates in the Arabian Gulf fostering regional maritime capability, security and interaction. CTF-151 was established in Jan 2009 as a counter piracy mission based Task Force operating in the CMF AOR. Besides, CTF-151 the EU and NATO Task Forces and many navies are independently operating in the region on counter-piracy mission.

CMF over the years has done a good job in maintaining order in the regional maritime domain. It has been able to deter the miscreants from any spectacular attack on shipping in the region. Nevertheless, its success against other illicit activities supporting terrorism, like narcotics trafficking and movement of weapons and

personnel, has not been on the same scale. One of the main reasons for this is lack of effective inter-agency coordination between maritime security agencies of littoral countries and between these agencies and the CMF. Other measures through which the CMF can better achieve its objectives are:

- a) Regional nations are less amenable to foreign presence in respective areas of interest. Greater transparency and acceptability to coalition operations can be accrued by providing more command opportunities to regional nations who are also members of the CMF.
- b) Command tenure of the Combined Task Forces, which is 4-6 months, is short to effectively pursue regional engagement and follow up operational plan. Increasing the duration of command tenure to 9-12 months would enable the CTF commanders to:
 - Better develop relationship with key leadership of the regional maritime forces, and
 - Meaningfully execute the follow up operational plan.
- c) Regional nations' maritime forces need to be strengthened to:
 - Improve regional forces' participation in coalition efforts,
 - Mitigate force flow problems, and
 - Make regional maritime forces capable enough to deal with terrorism threat on their own, which is also the desired end state of the CMF.
- d) Timely actionable intelligence is necessary to interdict ITO related activities in the region. CMF Task Forces are completely dependent on NAVCENT for ops Intel. Intel updates to CMF are delayed mainly due to releasability issues, which if addressed can help in successful interception & disruption of suspected vessel.

Vision for a Regional Maritime Security Regime

The launch pads for most illicit activities in the regional maritime domain are the coastal waters of littoral states, where only the concerned country has jurisdiction to operate. Most coastal states in the region have long and porous coastlines that are largely unregulated. The capacity of most countries to effectively monitor and regulate traffic through their coasts is limited. The present regional maritime security regime provided by the CMF is restricted to international waters, where action against any illicit activity is taken by shifting the concerned unit into national command as the CMF does not have any political authority to do so. This arrangement though working reasonably well in international waters is inhibited in territorial waters unless the country owning the unit involved has bilateral arrangements with the concerned coastal state.

For any regional maritime security regime to produce results, it is important to have an effective security mechanism in the coastal waters. Additionally, close coordination and information sharing between the concerned states' maritime security organizations and the CMF, would facilitate effective action against illicit operators. In this regard inter-agency Memoranda of Understanding between the maritime security agencies of the regional states and with the CMF on sharing of information and coordinating action against the illicit operators would augment the maritime security efforts. The international community also needs to help in strengthening the coastal security apparatus of the regional countries. In this manner we can eventually form a regional maritime security regime whereby the regional countries can secure their respective coastlines, share information and coordinate action against illicit activities with each other and with the CMF.

I may mention here that Pakistan Maritime Security Agency has taken the initiative and MoU with Royal Oman Police Coast Guard and Coast Guard of Yemen are being processed. In future, MoU with maritime security agencies of other concerned regional countries can also be signed and subsequently this bilateral understanding can be expanded into a multilateral arrangement. The international community, particularly the nations forming the CMF, need to support such an inter-agency coastal security coalition of regional nations.

Conclusion

In conclusion one can say that the regional maritime security situation in the Arabian Sea region is precarious. The littoral waters that are the key to maritime security are largely unregulated due to the limited capacity of the littoral states. For any regional maritime security regime to be effective it is important to monitor and guard the littoral waters and share information about illicit activities between the concerned agencies of the coastal states and with the international coalition operating in the region. This can only be achieved by strengthening the regional maritime security agencies and through bilateral interagency memoranda of understanding, which can subsequently be made multilateral and extended to include the CMF.

The Future of Maritime Surveillance in an Era of Contested Maritime Domains

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Abstract

Maritime surveillance is indispensable to guarantee maritime domain awareness. Maritime domain awareness, in turn, is a prerequisite for the effective use of the global maritime domain. Access to, maneuverability within, and use of the global maritime domain are increasingly contested due to long-term trends such as shifts in global maritime trade patterns, rivalries prompted by the strive for resource supply security, demographic trends in key coastal areas, and maritime power projection by different actors. Ironically, though, members of the transatlantic community are hailing the freedom of the global maritime domain at the a time when their naval capabilities are in relative decline due to global military overstretch, shifting policy preferences, and public debts that are out of control. This will create strategic problems for the transatlantic community, because long-term trends point towards the need to substantially expand maritime surveillance. In the future, it will be more and more important to explore what is going on in the deep sea, the littorals and on inland waterways; there is a fundamental need to come to terms with the maritime domain's dependence on other global commons, in particular space and cyberspace; intelligence-based knowledge provision from various state and non-state sources must be fused into a comprehensive recognized maritime picture thus prompting new needs for comprehensive interagency interaction at national, regional, and international levels. In addressing all of these issues one question will be key: Given the tectonic shift of power from industrialized countries to a multi-polar international framework who is going to set the rules, norms, principles, and standards relevant for maritime surveillance and thus the command of the global maritime domain?

Introduction

People tend to realize the precious and yet transient nature of public goods only when they are in short supply. This is exactly what happens nowadays with regard to the growing attention that policy planners and decision-makers devote to the so-called global commons, i.e., sea, air, space, and cyberspace. Global commons are defined as “resource domains to which all nations have legal access,”¹ but this understanding is at stake. As the world is witnessing a shift of power from an international system with a clear leadership center to a more diffuse multipolar framework, the global commons are those domains where the nascent rules of international politics in the 21st century are being tested.

The global commons bind together those domains that are indispensable for the free flow of goods, people, resources, and information that make up the backbone of a globalized world. Actors that are able to influence the quality and the direction of these flows exert strategic influence. This is the reason why the global commons are increasingly contested. Toughening competition for the global commons results from the need to address several pressing global questions. These include the challenge of a growing world population, the need for access to fossil and mineral resources, growing demand for nutrition, and the likely impact of global climate change to name but a few examples. At the heart of all these trends is the demand for sustainable solutions to satisfy the basic needs of modern societies. This struggle is directly linked to the management of the global commons. The national level of ambition envisaged to satisfy the basic needs has a direct impact on the capabilities required to shape the global commons. In return, existing capabilities to make use of the global commons determine the leeway every nation enjoys in shaping policy solutions commensurate with the respective requirements to satisfy its basic need. As a consequence, unrestricted access to, maneuverability within and use of the interrelated global commons is at the heart of international politics in the 21st century. This will shape future requirements for maritime surveillance.

As Figure 1 illustrates, the extent to which every nation can use the global maritime domain very much

¹ Susan J. Buck's definition quoted by Redden/Hughes (2010), p. 1.

depends on the understanding of the characteristics and drivers that shape this environment. To this purpose nations aim at establishing maritime domain awareness, which depends on maritime surveillance. Maritime surveillance includes all necessary action needed to identify, monitor, and understand activities in the maritime domain and in all other domains relevant to the maritime environment. This requires a broad understanding of maritime use cases. In what follows, the paper will describe key developments in four categories: maritime transport, marine resources, maritime habitat, and maritime power project. The key trends for each category will be discussed, followed by reflections on the likely impact on maritime surveillance.

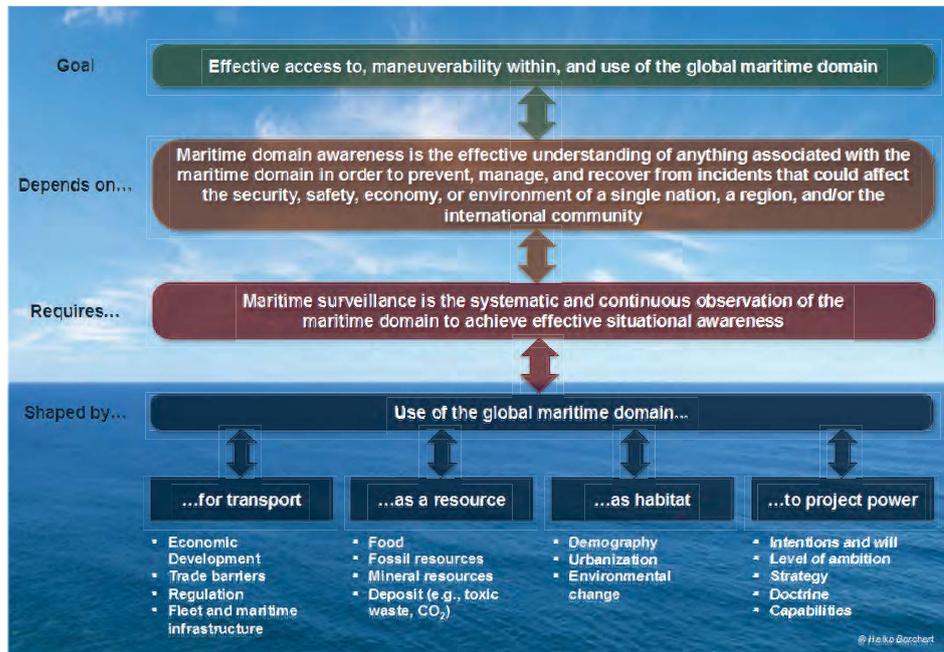


Figure 1: Analytical Framework²

Maritime Transportation

Economic globalization and maritime transportation go hand in hand as around 90-95% of world trade is being shipped. As a consequence maritime transportation closely follows economic cycles. Several trends are particularly noteworthy:

■ Fossil energy resources

For decades the shipment of crude oil, petroleum products, and gas has dominated seaborne trade by volume. As energy preferences shift from fossil energy resources to renewables it may be speculated how this trend will affect seaborne trade. Already today, Asian countries are the biggest importers of oil from the Persian Gulf.³ As a consequence they have an immediate strategic interest in the stability of the key maritime routes needed to guarantee uninterrupted flows of oil to their growing economies. China, for example, receives 80% of its oil imports supplied mainly by Saudi Arabia, Angola, Iran, and Oman through the Strait of Malacca.⁴ Thus the long-term question is whether shifting energy preferences will drive Europe, the United States and Asia apart as they follow diverging interests or bring them together to find common solutions to make seaborne energy-resource transport through the Indian Ocean safe and secure.

■ Maritime transport hubs and transport connections

When looking at the aggregate level of container terminal capacities, ship construction capacities, controlled fleets, and liner shipping connectivity it becomes clear that Asia is the center of gravity of global

² Based in parts on definitions by: US Government (2005), p. 1; Wise Pen Team (2010), p. 47

³ BP (2010), p. 21.

⁴ Erickson/Collins (2010); EIA (2011a).

maritime transport. Of the world's 20 busiest container terminals⁵ 14 can be found in South-East Asia, and among the world's ten busiest container terminals only two (Dubai and Rotterdam) are not located in South-East Asia.⁶ While countries from the transatlantic community and South-East Asia share ranks among the top 10 of the world's best-connected countries, China, Hong Kong, and Singapore lead the list. In 2010, for example, twice as many ships called at ports in China than at ports in the Netherlands or Germany, Europe's best-connected countries.⁷ These developments point towards a global maritime freight transportation system where Asian markets play the key role. As Jean-Paul Rodrigue⁸ has pointed out, the emergence of Brazil, India, and China as economic power engines could lead to a new maritime connection in the Southern Hemisphere directly linking the respective markets. Russia, in turn, could benefit from the opening of the northern passage across the arctic as this route is expected to cut transport distances significantly, in particular for shipments between Europe and Asia.⁹ In this regard it is more than noteworthy that Russia operates by far the world's largest fleet of icebreakers including nuclear-powered icebreakers, an asset that is missing from the arsenal in the United States, Canada, China, Norway, or Denmark, which all claim access to the North Pole.¹⁰

- **Inland waterways**

Another important aspect is the role of inland waterways that make an essential contribution to prosperity in well-developed economic regions. Brazil, by contrast, uses only around a fourth of its navigable inland waterways for economic purposes, but wants to double their share of the overall transportation mix until 2025.¹¹ This prompts several questions with regard to the multifold use of inland waterways for transport and hydropower generation as well as the use of vessel traffic management systems for inland waterways. Brazil's example makes clear that increasing reliance on inland waterways to advance economic prosperity will also prompt additional maritime surveillance needs. Inland waterways connect regions in the hinterland with international sea-lanes. Thus they are a vital link in the global maritime supply chain. But if surveillance and control of these inland waterways wanes, as is the case in the Niger delta for example, they deprive the respective nations of an important instrument to generate local prosperity. As a consequence, the international community should pay more attention to inland waterway surveillance in developing countries.

- **Maritime transport technology**

Finally, maritime transport technology should be kept in mind as well. Technologies that help advance logistics efficiency will become even more important in the future, as competition between harbors is likely to grow. Several options are feasible. Advanced use of information and communication technology could help drive the digitization of global logistics thus making it easier to track and trace goods. This, of course, is also relevant for regional and global security as will be discussed below. Materials technology is of increasing importance for ship builders because material innovation can help reduce energy consumption and CO₂ emission by cargo ships. In addition, it could also be speculated whether the use of automatic and unmanned systems could help improve operations in congested coastal zones and harbors. For example, unmanned systems could be used for commercial logistics seabasing thereby providing an opportunity to load and unload cargo vessels without the need to enter densely populated harbor infrastructures. Automatic or semi-automatic platforms could also provide offshore refueling stations thus reducing the need for ships to travel through dangerous waters. And thought should be given to the idea of using unmanned maritime cargo systems along pre-configured routes to speed up short-distance maritime transport and boost trade along coastal hubs.

These maritime transportation trends could prompt several additional maritime surveillance requirements:

- **Promote pan-regional public-private information exchanges for global supply chain surveillance**

The global maritime supply chain, which consists of many different stakeholders, is part of a global multimodal supply chain that connects maritime transport with road and railway networks as well as

⁵ In terms of 20-foot equivalent units.

⁶ UNCTAD (2010a), p. 97

⁷ UNCTAD (2010b).

⁸ Rodrigue (2010), p. 19.

⁹ Christensen (2009).

¹⁰ Baltic Icebreaking Management (2008).

¹¹ Passos (2010).

commercial air transport. If current trade projections materialize, multimodal transport will become even more important to handle global trade flows. In order to advance the security of global supply chains, more information sharing between public and private stakeholders will be needed to avoid security breaches and prevent the abuse of global logistics for illicit activities. This puts a premium on the quality of information sharing. Two aspects are particularly important. First, there is a need for comprehensive risk assessments along the global supply chain in order to determine which components are most vulnerable and how dangerous goods could be passed along different modes of transport. In addition, the public sector should be engaged in creating trustworthy information exchange environments. Public agents could act as honest brokers to mitigate the risk of information exchange between corporate actors that are direct competitors and might thus be reluctant to share sensitive information.

▪ **Develop stand-off screening technologies to detect illicit goods**

Technology proliferation, breaches of international sanctions, and the transfer of illicit goods are some of the most pressing security challenges directly affecting maritime trade. Given high maritime transport volumes, cargo screening at points of embarkation and disembarkation runs into practical problems. Therefore another layer of safety and security controls on sea while ships are approaching harbors might be needed. News reports indicate that radar technology can be used to scan the cargo of cargo planes mid-flight.¹² This kind of technology could be used at sea as well, if the physical characteristics of a salty and humid environment do not infringe upon the technology's performance. In combination with air- and space-based assets this could provide an opportunity to establish standoff screening technologies thus pushing maritime surveillance to new levels.

▪ **Assess surveillance needs resulting from the use of autonomous systems**

The commercial use of unmanned systems at sea would very likely prompt demands similar to those addressed by the aerospace industry to make sure that unmanned aerial systems can operate alongside conventional air traffic. Concepts of operation for the use of unmanned systems at sea will have to be complemented with technical solutions to detect, identify, and track these platforms. Sense and avoid capabilities will be needed to prevent collisions. Legal questions pertaining to the certification of unmanned under-/above-water systems would have to be addressed as well. Finally, reliance on these systems would require a networked approach to maritime traffic management. In doing so, information security would need to receive priority treatment (see section 5).

▪ **Consider technology pull-through for surveillance in different maritime environments**

The growing use of inland waterways might prompt demands for sophisticated solutions to provide maritime surveillance in a domain that differs significantly from the high seas, for which many available technologies have been developed. For example, mud and sandbanks in a riverine environment could pose challenges for sonars and sensors that have hitherto been used in blue waters. Similarly, surveillance technology for use up in the High North might have to withstand very tough environmental conditions. Addressing these challenges also creates interesting opportunities for public-private research projects to assess the feasibility of technology pull-through from one maritime environment to another.

MARINE RESOURCES

The global maritime domain plays an increasingly important role as a provider of many different resources. Access to these resources and access to the maritime transport routes needed to bring these resources to consumer markets will be one of the key trends shaping the maritime interests of various countries and thus also their preferences to build up maritime capabilities needed to protect their interests.

¹² Intelligence Online (2010), p. 4.

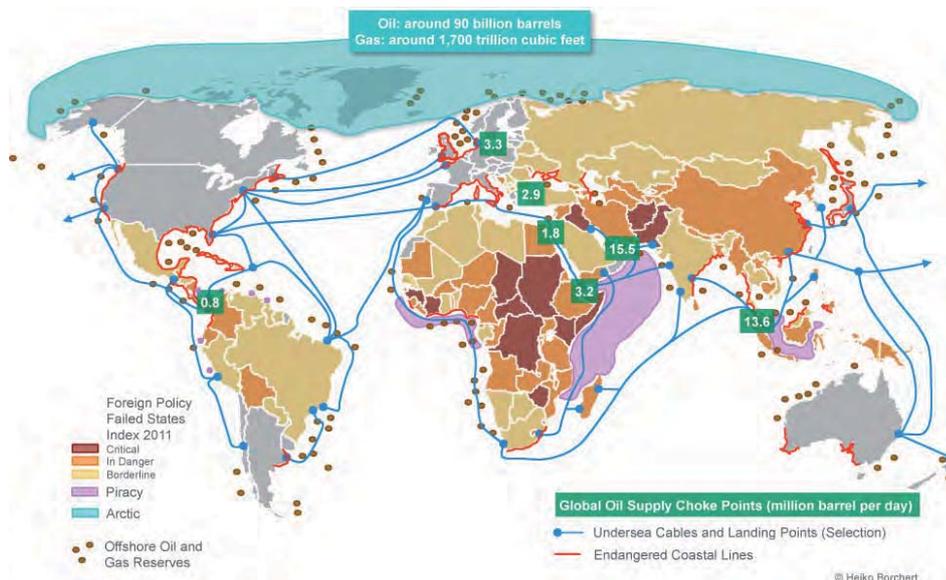


Figure 2: Key Resources and Risk Areas in the Maritime Domain¹³

Figure 2 gives an overview of some of the most important marine resource areas and puts them in context with other security-relevant issues such as fragile governance structures and the scope of pirate activities. Against this background the following facts and trends are worth considering:

- **Fish stock**

Fish continues to be a major source of protein for large parts of the world population. World supply of fish and aquaculture has grown steadily reaching 145 million tons in 2009 after roughly 130 million tons in 2000. Between 1998-2008 the value of fish and fishery products that was exported doubled from around \$51bn to around \$102bn. But global fish stock is in danger. Today, around 50% of the world's fish stock is fully exploited and more than 30% is overexploited. Only 15% of global fish stock is underexploited or moderately exploited. Climate change creates additional problems. Extreme weather conditions could affect the distribution of fish, habitat size, and productivity thus worsening fishermen's perspectives. Illicit fishing aggravates these problems even further. Maritime disputes seem to make things even worse as news reports about illegal fishing activities off the coast of Libya in early June 2011 have shown.¹⁴

- **Offshore reserves**

Given the world's growing hunger for fossil energy resources, offshore reserves become more and more important. Overall it is hard to provide figures for the total share of global offshore oil and gas reserves. In the European Economic Area, for example, around 90% of the region's oil and 60% of its gas production originates from offshore.¹⁵ But while Europe's offshore fossil reserves are in decline, new reserves are found in other regions of the world. Estimates assume that the High North could harbor around 90 million barrels of oil (around the proven reserves of the United Arab Emirates) and around 1,700 trillion cubic feet of natural gas (around the proven reserves of Russia). Approximately 84% of these reserves are offshore.¹⁶ Energy resource-related claims by different countries also collide over access to the Spratley Islands and gas reserves in the eastern Mediterranean. The latter is a particular case, because exploiting the gas fields off the coast of Israel and Lebanon has not only prompted rivaling claims by the two respective countries, but also from Hezbollah.¹⁷ In addition to conflicting claims, technical aspects of offshore activities need to be taken into account. Whereas Deepwater Horizon in the Gulf of Mexico was operating oil drills at around 1,500 meters below the waterline, Petrobras will have to drill down 7,000 meters in order to exploit huge oil fields off the Brazilian coast.¹⁸ This obviously prompts questions with

¹³ BP (2010); DCDC (2007); EIA (2011b); Foreign Policy (2011); ICC CCS (2011); O'Rourke (2010); Telegeography (2010); Zierul (2010).

¹⁴ FAO (2010), p. 4, 35, 52; FAO (2002), p. 4; Seashepherd (2011).

¹⁵ European Commission (2010), p. 2

¹⁶ O'Rourke (2010a).

¹⁷ Ratner (2011).

¹⁸ FTD (2011). p. 7

regard to the safety of the technical installations used for these challenging operations.¹⁹ Additional energy-related offshore activities relevant for maritime surveillance include plans for small offshore nuclear power plants that could be installed on the seabed and the construction of gigantic offshore wind parks that can cause problems for radars and submarines.²⁰

- **Chokepoints**

Global oil supply chokepoints illustrated in Figure 2 are another serious concern. Rivalries between different states and threats to block key chokepoints such as the Strait of Hormuz or the Strait of Malacca not only affect maritime trade but also international commodity prices. In addition, critical passages such as the Strait of Bosphorus raise the specter of large-scale incidents at the heart of a multi-million city that would cause major casualties and significant environmental damages. Irrespective of the world's energy preferences, key chokepoints like the Strait of Hormuz are very likely to remain hot spots for the near future, because capabilities to control the strait or disrupt the control of the Strait can be used as a political currency.

- **Undersea communication cables**

Finally, the global maritime domain is home to one of the world's most important but most often overlooked infrastructures: undersea communication cables. Undersea communication cables are absolutely vital because they handle almost all of the world's intercontinental digital traffic. As global bandwidth demand is on the rise, undersea communication cables will grow in importance. Vulnerability of these cables in transition from deep water to the landing points is a major concern as most of these landing points are located in areas with heavy maritime traffic. In addition to natural hazards (e.g., earthquakes), technical failures, and interruptions caused by negligence (e.g., anchors), undersea cables have also become the objects of theft, and it is even possible that pirates target undersea cable repair ships.²¹

Access to and exploitation of marine resources will shape maritime interests in the 21st century. As a consequence all of the above mentioned activities should receive utmost attention when defining future maritime surveillance capabilities. Among other things the following action could be taken into account:

- **Advance underwater and deep sea situational awareness**

In light of a expanding offshore activities, a comprehensive recognized maritime picture will require the systematic and continuous monitoring of all relevant above- and underwater activities. This will pose challenges. So far, underwater situational awareness is most often restricted to operations like anti-submarine warfare or mine clearance. This is not enough. When considering the exploitation of marine resources in contested areas, a situational picture of underwater exploitation activities could create transparency and thus advance confidence between the parties involved.

- **Think about protection concepts for key underwater infrastructures**

If conflicting claims about access to offshore oil and gas reserves are a harbinger of possible future conflicts, then one should take into account the possibility that critical underwater infrastructures could be attacked. These attacks would serve several purposes. The sinking of Deepwater Horizon made it clear, that environmental damage is significant. Public outrage caused by the destruction of vulnerable ecosystems can escalate and lead to the loss of trust and confidence in the respective public and private actors involved in handling the crisis. In addition, there are financial losses due to the damage of costly infrastructures and revenue losses due to installations that are out of function. One can speculate about the motives, resources, and expertise of possible perpetrators, but it seems quite obvious that protection against a comprehensive set of risks (e.g., natural hazards, technical vulnerabilities, use of weapons) should be taken seriously. As many underwater infrastructures would most likely affect the interests of several coastal parties, the need to manage the respective risks could create opportunities for cooperation.

- **Expand capabilities to monitor, track, and trace underwater activities**

Underwater situational awareness requires capabilities to monitor, track and trace underwater activities. These multi-purpose capabilities would serve different ends: They would play an eminent role in advancing

¹⁹ For an impression of the technological challenges related to subsea energy-resource exploitation, see: <<http://innovate.statoil.com/challenges/Pages/SubseaTechnology.aspx>> (access 21 June 2011).

²⁰ WNN (2011); EADS (2011); Thales Instruments (2011).

²¹ Rogucci (2010); ICPC/UNEP (2009).

environmental protection, for example, by providing information about deep sea drilling and could also help deter and prevent illegal fishing. Tracking and tracing underwater activities could also play a key role in advancing the protection of undersea communication cables in transit from deep waters to landing points. Finally, underwater tracking and tracing would also be of use for the International Seabed Authority, whose task is to administer mineral resources in the international seabed.

- **Consider cooperative monitoring operations for contested Exclusive Economic Zones**

The Exclusive Economic Zone (EEZ) is a vital geostrategic area covering the transition between the territorial sea and the high seas. Current estimates assume that EEZs comprise around one third of the world's seas.²² The problem is that this zone is likely to grow as more and more countries engage in EEZ-related claims of sovereignty, security, and environmental protection. As James Kraska has shown, these claims are not only a source of instability in the international law of the sea, they also serve as a means to limit the effectiveness of expeditionary sea power by regulating military activities in the EEZ.²³ Therefore maritime surveillance should put particular emphasis on monitoring developments in EEZ. All of the above activities help accomplish this task. But there is also the risk that information gathered from these activities is misused by coastal states to exclude others from using the EEZ. Therefore thought should be given to deploying international monitoring operations for particularly contested EEZ. Joint monitoring operations involving the Navies, coast guards, law enforcement agencies, environmental protection agencies and other stakeholders could help advance confidence building. Given their traditional diplomatic role, Navies could lead by example and conduct more joint monitoring operations in waters of strategic importance (Figure 2). In parallel, military diplomacy could be stepped up along key maritime supply routes. This would also support other policy goals. For example, unrestricted access to maritime supply routes is an important precondition for effective development policy in the 21st century. Navies and development agencies could thus join forces in stabilizing maritime transport hubs in important coastal zones.

Maritime Habitat

Already today around 70% of the world's population lives in coastal regions. Given current projections of future population growth, this concentration is very likely to grow thus increasing the pressure on the littorals. In order to assess future maritime surveillance requirements the following trends should be taken into account:

- **Demographics**

Demographic development has an ambivalent effect on the maritime domain. As illustrated in Figure 3 world population is projected to grow from around 7bn people right now to over 9bn people in 2050 with the most significant increases taking place in Asia and Africa. This will put an extra burden on rapidly evolving megacities. Most of them can be found along the world's busiest coastal zones. Megacities are attractive hubs of economic prosperity and provide access to global maritime supply chains. But they are also at risk due to the inflow of people, inadequate infrastructures, and activities by violent non-state actors such as gangs and organized crime (see section 5). As a consequence, fragile megacities mixed with state-level insecurity across the world's most important coastal zones are very likely to become the next big security issue that the international community should prepare for. In Europe, by contrast, demographic change might come with different consequences for the maritime business. As Europe's population is shrinking and growing older there might be a shortage of seafarer and qualified officers. This, in turn, could affect compliance with existing environmental, safety, and security regulation on board of ships and perhaps also in busy harbors.²⁴ In addition, increases in social spending due to demographic changes will cause public spending shifts most likely to the detriment of maritime capabilities.

²² Till (2009), p. 302; Kraska (2011), pp. 4-7.

²³ Kraska (2011), p. 9, 13, 18.

²⁴ Lloyd's Register-Fairplay (2008), pp. 199-200.



Figure 3: Megacities in 2025 (million inhabitants)²⁵

■ **Spatial planning**

Another aspect closely related with demographic change is spatial planning. Land-based growth opportunities for megacities are limited. As a consequence, megacities could expand offshore. There are many examples of large cities establishing artificial land zones into the littorals to create more space for transportation infrastructure such as airports. Going one step further, Japanese construction company Shimizu envisions so called “Green Floats”, urban villages built on floating platforms that could provide a new home for up to 50,000 people on one platform. Several platforms could be tied together to create floating cities at sea. Green Floats could also provide an option for island states threatened by the risk of rising sea levels.²⁶

■ **Climate change and rising sea levels**

Climate change has been identified as a threat multiplier likely to contribute to instability in different regions of the world.²⁷ In general, we can assume that the impact of climate change on domestic stability will have an influence on the international behavior of states.²⁸ What matters most in terms of future maritime surveillance requirements is the impact of climate change on sea levels. Although there are still significant uncertainties in the projections of sea level rise, the Intergovernmental Panel on Climate Change concluded that “sea level rise is one of the longest-term consequences” of climate change.²⁹ Many coastal areas are vulnerable to rising sea levels (see Figure 2, red line), but it has been estimated that “75% of all people living in areas vulnerable to sea level rises are in Asia, with the poorer nations not at risk.”³⁰ Refugee flows and internal displacement of people might be the consequences that will increase the burden put on megacities described above. In addition, rising sea levels will impact the economy, as key infrastructure components can be found in coastal zones. For example, China’s most important terminals for the supply of liquefied natural gas (LNG) are on the on the east coast. Nigeria yields around 95% of its export earnings from supplying oil and gas. These sales account for around 65% of the Nigerian government’s revenues. And in the United States, the Louisiana Offshore Oil Port receives 13% of the country’s oil imports and is connected to 50% of the country’s refining capacities.³¹

²⁵ Msrnik; United Nations (2009a), p. 7; United Nations (2009b).

²⁶ Shimizu (2010).

²⁷ CNA (2007).

²⁸ Mazo (2010); Paskal (2010).

²⁹ IPCC (2010), p. 1.

³⁰ UNHABITAT (2010), p. 184.

³¹ LOOP (2011); EIA (2011a); EIA (2011c).

- **Pollution**

Finally, pollution of the ocean is getting worse. There are several risks such the release of sewage and wastes, chemical pollutants, spillover effects from exploiting fossil energy resources, and the uptake of plastics by fauna.³² Overall, research suggests, “resilience of the ocean to climate change impacts is severely compromised by the other stressors from human activities, including fisheries, pollution and habitat destruction.”³³ Therefore, maritime surveillance should incorporate initiatives to advance ecosystem-based management of marine and coastal areas.³⁴

Some ideas discussed in sections 2 and 3 will be of use in tackling the above-mentioned challenges. Additional thought should be given to the following options:

- **Develop comprehensive approaches to improve the resilience of megacities in coastal zones**

Maritime surveillance must take into account threats to the littorals because it will be much more difficult to address security risks from sea if coastal zones tumble towards instability. There is, however, no direct way to improve the resilience of coastal zones. Research findings even suggest that there might be counter intuitive effects: The lack of appropriate governance can be interpreted as a key root cause to many problems that contribute to maritime disorder. But there are situations when even criminal gangs benefit from improved governance “as access to markets and infrastructure improves and protection of the loot becomes less costly.”³⁵ As a consequence, there is a need for a Comprehensive Approach to address the very specific requirements of megacities in coastal zones. It should be considered whether an international initiative supported, for example, by the United Nations Environment Program, the United Nations Agency for Human Settlements, the International Maritime Organization, and the World Trade Organization in cooperation with the European Union, the North Atlantic Treaty Organization and important regional organizations from Africa, Latin America, and South-East Asia could provide a platform large enough for all relevant public and private actors to establish a stake in this important issue.

- **Advance early warning capabilities for coastal zones**

Early warning is important to advance coastal zone resilience. As extreme weather conditions are more likely in the future, there is a need for more resilient early warning infrastructures that survive even demanding environmental incidents. Mobile, ad hoc, and self-healing sensor networks could provide a valuable option. Thereby attention should be focused on smart multi-purpose sensors that could be used for communication, data transfer, monitoring of activities, and change detection. In addition it can be expected that demand for hydrographic information increases as underwater activities expand. Therefore collecting data and information about water depths and structures of the seabed should receive more attention. This also creates opportunities for multinational cooperation.

- **Be aware of challenges to existing legal regimes**

Existing maritime law will be challenged as excessive claims beyond the EEZs perfectly illustrate. This trend could be aggravated by ambitious plans for maritime urbanization and the use of inhabited maritime platforms as floating villages. Those countries interested in guaranteeing the freedom of the seas and the freedom of navigation would be well advised to closely monitor maritime sovereignty claims by resource-hungry and densely populated countries as these are the most likely challengers of the maritime status quo.

Maritime Power Projection

Power projection and the use of the maritime domain are strongly intertwined. Future trends suggest that traditional ways of projecting maritime power are at risk. This will have fundamental implications for maritime surveillance. In addition to excessive EEZ claims the following challenges should be addressed:

³² IPSO (2008), pp. 16-17.

³³ Rogers/Lafolley (2011), p. 6.

³⁴ UNEP (2011).

³⁵ De Groot/Rablen/Shortland (2011).

▪ **Strategic maritime capabilities**

More and more regional powers increase investments in strategic maritime capabilities. China and India are the two most obvious examples. Both put an emphasis on expanding their submarine fleets and invest in aircraft carriers. Both nations have also greatly expanded naval areas of operations, among others, by conducting simultaneous naval operations in the Mediterranean and in the Indian Ocean. China in addition has put a focus on anti-access and area denial (A2/AD) capabilities, C4ISR,³⁶ space-based assets, and information warfare thus significantly expanding the country's ability to deny an opponent freedom of manoeuvre.³⁷ Other countries follow this pattern. Australia's 2009 defense white paper foresees a "more potent" Navy able to conduct undersea warfare, anti-submarine warfare, and surface maritime warfare. The country will significantly increase its submarine fleet until 2030 and invest in unmanned underwater systems.³⁸ Brazil's 2008 national defense strategy is illuminating as it explicitly tasks the country's Navy to protect oil platforms, naval and oil facilities, and respond to threats against sea lanes. Brazil also wants to establish a powerful submarine fleet and is even considering the purchase of nuclear-powered submarines to protect offshore oil fields.³⁹ By contrast, many European countries are cutting back their naval assets due to budgetary problems.

▪ **Technology proliferation**

These investment priorities must be interpreted in light of the increasing danger of technology proliferation, in particular with regard to A2/AD capabilities. Ready-to-use containerized A2/AD weapon systems that can be operated from maritime vessels thus providing state and non-state actors the ability to expand their naval zone of influence further aggravate this risk. In addition, technology transfer proves increasingly ambivalent. Almost all of the aspiring development countries have made technology transfer a prerequisite for market access. As a consequence, defense suppliers' export prospects depend on their readiness to share technologies. This, however, is problematic if technology transfer to the end user cannot be controlled and thus opens the door for technology proliferation to other countries and non-state actors.

▪ **New partnerships**

In parallel to global power shifts we are also witnessing new cooperative ventures between countries with distinct regional and global maritime interests. One example is the most recent agreement between France and Russia to provide the Russian Navy with amphibious assault ships. The deal also seems to include technology transfer and could be complemented with other cooperative projects in the future. Another significant initiative is the training of Chinese Navy pilots on Brazilian aircraft carriers,⁴⁰ which should also be seen in light of China's interest in Brazilian offshore oil reserves. Cooperation in itself is not a problem, but it can create confusion if changing cooperation patterns make it more difficult to predict a nation's behavior.

▪ **Interdomain relations**

Additionally, thinking across all relevant domains in order to advance maritime surveillance is indispensable because „*intradomain* military operations are increasingly dependent on *interdomain* dependencies.“⁴¹ Naval operations, for example, depend on space-based assets and access to cyberspace. The former are needed for all sorts of communication and data exchange as well as navigation; the latter is indispensable to make sure that these exchanges are safe, secure, and reliable. In the future, maritime surveillance must prepare for deliberate action by state and non-state actors to disrupt important lines of communication; hide, spoof, and reroute digital traffic; or take out vital maritime infrastructures.

▪ **Non-state actors**

Finally, non-state actors also have an interest in using the maritime domain for their own interests. Pirates are the most prominent non-state maritime actors nowadays. Given data limitations it is difficult to assess the global costs caused by piracy, but studies assume that annual global costs could range from around

³⁶ Command, Control, Computers, Communication, Intelligence, Surveillance, and Reconnaissance.
³⁷ O'Rourke (2010b); Scott (2010); Kemp (2010); Department of Defense (2010); Yoshihara/Holmes (2010).

³⁸ Department of Defence (2009), pp. 70-74.

³⁹ Ministry of Defense (2008). pp. 20-22; AFP (2008).

⁴⁰ Thaler (2010).

⁴¹ Redden/Hughes (2010), p. 2. Emphasis added in original text.

\$5bn to \$16bn.⁴² Organized criminals engaged in illicit activities such as human trafficking and smuggling of heroin, cocaine, firearms, and counterfeit products also make a lot of money by exploiting maritime disorder.⁴³ The fact that organized crime and piracy come together in certain littoral hotspots has caused concern that terrorists could get involved as well. This could create a situation where all three rely on each other for operational support, funding, and the joint provision of support infrastructures.⁴⁴ In sum, the presence of non-state actors in the maritime domain makes operations in contested and congested littorals even more challenging and will generate additional requirements.

In terms of future maritime surveillance requirements these trends suggest that there will be an increased need to push intelligence cooperation to new levels and systematically address dependencies between the maritime domain and other global commons. That said four aspects deserve special attention:

- **Promote systematic and continuous all-source information fusion to counter adversarial A2/AD strategies**

Keeping track of a plethora of different activities in the maritime domain will become increasingly difficult. This prompts an immediate need for improved all-source information fusion. Several avenues should be pursued. First of all, supply chain monitoring to detect unwanted adversarial access to important A2/AD technologies becomes vital. This requires closer public-private information sharing to assess the credibility of all partners involved in the respective supply chain. In the maritime domain, monitoring adversarial build-up of A2/AD capabilities is likely to prompt further needs for improved and expanded reconnaissance capabilities. Geospatial assets are already beefed up in order to monitor resource-rich areas and keep track of vessels. Given the fact that some countries want to hide critical maritime infrastructures used for A2/AD purposes, ground-penetrating capabilities will gain in importance. Advancement of deep-sea capabilities to monitor the deployment of underwater platforms over large ocean areas should also be considered.⁴⁵

- **Address the maritime domain's cyber Achilles heal**

As pointed out above, the growing reliance on space and cyberspace is a particular concern, because the accidental or deliberate loss of these assets would seriously hamper maritime domain awareness. Therefore recognized maritime pictures and the relevant data and communication exchanges are high value targets for cyber hackers Navies, coast guards, and law enforcement agencies involved in the maritime domain are thus well advised to conduct cyber vulnerability analyses. In doing so it should be assessed whether certain types of naval operations increase dependence on reliable real-time digital traffic, as adversaries might have a special interest to interrupt these operations. These analyses should also incorporate the private sector. Digitized global supply chains require data integrity in order to guarantee smooth operations and make sure that transported goods are neither lost nor stolen. As a consequence it might be useful to assess whether existing maritime safety and security regulations such as the ISPS Code and other documents already address cyber risks and if there is a need to adapt them in light of current and projected cyber vulnerabilities.

- **Promote human terrain mapping in the maritime domain**

Growing maritime activities by non-state actors and the prospect of closer bonds between organized crime, pirates, and terrorist groups pose additional challenges for maritime surveillance. These challenges are similar to the situation land forces face ashore: in order to operate effectively, there is a need for human terrain mapping to identify the key actors and establish social relations between them. Doing the same for the maritime domain might require new thinking as existing recognized maritime pictures focus on identifying and tracking vessels. This, however, is no longer enough. In order to deal with cluttered maritime environments that provide manifold opportunities for non-state actors to conceal their activities, human terrain mapping will close an existing gap in maritime surveillance. In addition, human terrain mapping will also help establish connections between offshore and onshore activities by identifying the key actors involved on both sides. As a result human terrain mapping can improve the sustainability of naval stability and naval law enforcement activities in concert with other operations planned and executed ashore.

⁴² Geopolicity (2011); Bowden (2010).

⁴³ UNODC (2010).

⁴⁴ Murphy (2009).

⁴⁵ Scott (2011).

▪ **Improve capabilities for non-cooperative identification of objects and Individuals**

Identifying a target that is non-cooperative is a traditional challenge also in the maritime domain. Different technologies are available to identify non-cooperative platforms and reduce the black picture.⁴⁶ The identification of individuals at sea, by contrast, is a more recent requirement that goes hand in hand with human terrain mapping in the maritime domain. The need to identify individuals is a direct consequence of asymmetric conflicts where non-state actors have the upper hand as they can conceal more easily. But naval law enforcement operations create a need for the proper identification of individuals. As a result, Navies have started to use biometrics such as fingerprint identification, face recognition or iris recognition to establish the identity of individuals. Biometrically enabled information is shared with partners in order to check criminal track records for example. Non-cooperative identification of individuals by use of biometrics is more challenging. There are different biometric standoff technologies, but most of them work in controlled environments only. Using the same techniques in a maritime environment requires more research, which opens the door for international cooperation.

▪ **Promote the use of predictive analytics and behavioral models**

Locating, tracking, and anticipating possible threats to the maritime domain are key capabilities of the Navies.⁴⁷ In a maritime environment, where non-state actors are increasingly active, these capabilities need to be strengthened by promoting the use of behavioral models and predictive analytics. Both methods can be used to identify suspicious activities by comparing current information with patterns recognized from analyzing past information. In combination with modeling and simulation these insights can be used to advance the quality of information generated by recognized maritime pictures thus providing added value to operators, planners, and decision-makers engaged in the maritime domain.

Conclusion

Multiple uses of the maritime domain will create new challenges for maritime surveillance in the future. Some of these challenges can be addressed with the help of technology other challenges will require new concepts and perhaps even new institutional frameworks. Finding common ground to address these challenges will be far from easy. Too many different forces are pulling into different and sometimes even opposite directions

As this analysis has shown, there is a growing number of non-state actors with a serious interest in maritime disorder. Tackling their activities is difficult as they have mastered the art of concealment and managed to establish links between illicit economic activities and the regular economy. In addition, more and more states realize that command of the littorals is a currency that can be used to leverage their own political ambitions. Another group of states goes even further and engages in establishing strategic maritime power projection and A2/AD capabilities.

Overall it seems that those actors that want to use the maritime domain for their very own ambitions are gaining the upper hand whereas those actors willing to defend the freedom of the sea and the freedom of navigation face a hard time closing their ranks. As a consequence, it is anything but clear who will shape the rules, norms, principles, and standards that guide future action in the maritime domain. In the end, this is probably the most serious strategic challenge to the maritime interests of the transatlantic community. Its members will have to realize that aspiring countries from other regions around the world will contest their way of "leadership by standardization." This can create opportunities for cooperation, but it will also produce risks that need to be handled in order to avoid escalation.

⁴⁶ Wise Pen Team (2010), p. 27.

⁴⁷ Wise Pen Team (2010), p. 43.

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Strategic Framework for Maritime Surveillance

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From a strategic point of view, we can identify several global actors feeling some kind of responsibility for maritime surveillance. The following is reflecting the actual situation and is not taken into consideration all the maritime information provided by private companies and non-governmental stakeholders.

But we are aware that for example Google is offering a maritime picture which claims to be “comprehensive” but we do not know the criteria, the sources and most important, the delay between detection and distribution. Some ship-owners have their own way of keeping a picture of their ships and we know that big logistic companies, the “global” actors, are very keen in keeping track of their cargo and by doing so, established a very reliable and qualified picture of their transport system, with emphasis on maritime transport.

But asking for a strategic view, we are dealing with three key players responsible for maritime surveillance:

1. The United Nations through the International Maritime Organization (IMO) as a well experienced global actor;
2. The North Atlantic Treaty Organization (NATO), for the most important Navies of the world, and due to the “Partnership for Peace Program” with additional opportunities to introduce surveillance procedure and standards in an almost global way for non NATO navies; and
3. The European Union through the European Commission, the Military Staff and the European Defence Agency.

All three are acting with a more or less global claim or at least interregional aspiration. They have developed definitions, procedures and standards for the maritime domain with a civil and military range. Up to now these definitions, procedures and standards are still under consideration and disputed outside their areas of responsibility and most of them are providing a good but sectorial picture of the maritime domain. Therefore all three, IMO, NATO and EU should agree upon some principles which must be used as a common ground for further developments:

A comprehensive international and interagency approach is essential. A regional approach, supported by regional pilot projects, is a pragmatic way ahead. A “Step by Step” approach is one way to overcome sectorial solutions and will increase a better common understanding. A change in mindset from “need to know” to “need to share” and “responsible to share” is urgently needed and living in the “information age” an obvious step to achieve better maritime surveillance.

A better understanding that Maritime Surveillance is a prerequisite for Maritime Safety, Security and Defence and a catalyst in all maritime processes. The principle of “Supporting” and “Supported”, well understood in the military, must be introduced into the civil maritime thinking and their operations as well. This does lead us to a demand for leadership in maritime matters and the leadership will be executed by civil or military leadership, depending on the situation.

From a strategic perspective, UN, NATO and EU have to provide three levels of responsibility:

1. The strategic level:
 - All three organizations have generated their Security Strategies.
 - The UN’s Maritime Strategy is the United Nations Convention on the Law of the Sea,
 - NATO has an agreed “Alliance Maritime Strategy”,
 - EU has no maritime strategy yet, but an “Integrated Maritime Policy” focussing on economic, social and environmental issues, with an option for maritime surveillance.

2. The operational level:

- The UN through the IMO have limited themselves to the area of “Safety”, but adopting this restrictions after 9/11, to include “Security” as a subpart of “Safety”. UN have limited to none operational experience and no capacity to act.
- NATO has a far developed and experienced operational capacity, an appropriate Command and Control structure and a far reaching understanding in all operational matters. NATO has an agreed “Concept for NATO Maritime Security Operations”(MSO).
- UN and EU have no conceptual document for maritime operations, but we have to recognize that the UN is doing its first Maritime Security operation “UNIFIL” in the Mediterranean Sea. The EU is doing its first Maritime Security operation “ATALANTA” in the Gulf of Aden and West Indian Ocean. Both operations are based upon recognized pictures of the maritime situation and they are shared between civil and military actors.
- The lack of strategic and operational documents for maritime security in the UN and EU is causing problems on the operational and tactical level which have to be solved for the sake of our security.

3. The tactical level:

- NATO only has tactical procedures and formats, developed during the time of the Cold War and adopted and amplified during the decade from 1990 to 2000 through the “Partnership for Peace Program” and a number of multilateral agreements between EU and NATO nations.
- The on-going operations against piracy in the Gulf of Aden and West Indian Ocean is providing through the SHADE process a better information exchange between all participating navies and merchant ships: a unique opportunity for global procedures and basic standards.

All three key players are covering a great part of the spectrum of maritime surveillance, both civil and military. But we can identify a number of regional activities, increasing ambitions and partly well executed maritime surveillance activities. ReCAAP information sharing centre is an intergovernmental organization in South East Asia for example and equal organizations will be established in South America, the Maritime Domain Awareness is slowly increasing. The EU through its Commission has started two pilot projects, one in the Mediterranean Sea (BlueMassMed) and one in the Northern Sea Basins (MARSUNO).

To achieve a better common information sharing environment, we have to increase maritime situational or domain awareness and we have to achieve this awareness by a better maritime surveillance, both are linked to each other and have a strategic dimension. To achieve good governance at sea, we need to bring together already existing surveillance systems, projects and stakeholders. We have to begin with the lowest possible agreeable level to exchange data, information and knowledge. In this context, definitions, standards and procedures must be discussed in order to achieve compatible standards at least as a first step before we can take the next step to agree upon common standards.

Therefore a better coordination of Coast Guard operations and a further more advanced cooperation between Coast Guards and Navies must be promoted by UN, NATO and the EU for the sake of maritime surveillance and security. A precondition for a better coordination with all private maritime actors is that the governmental actors are presenting an impressive example for coordination and cooperation. The purpose of maritime surveillance is to achieve maritime domain awareness and through this awareness Maritime Security and Defence. At the end it is my intention to remind all who are having responsibility on the strategic level about a very important circle: The circle from “Early Warning” to “conflict Prevention” to Crisis Management” and “Post Conflict Peace Building” is valid for the maritime domain as well. But to be successful in the spirit of the circle, we need

1. A European Maritime Security Strategy as a framework how to decide and act in an appropriate manner,
2. We need a European Maritime Security Strategy to achieve and improve civil – military co-ordination and co-operation to build trust and confidence between all stakeholders,
3. We need a European Maritime Security Strategy to avoid duplication of efforts, focus investments to the purpose and will reduce the number of systems for maritime surveillance.

Maritime Security Co-operation: A Practitioner's View

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Abstract

This paper explores the Canadian approach to a comprehensive “Whole of Government” approach to Maritime Security Co-operation. It provides the background and context for the impetus to “close the seams” between Defence and Security which led to the stand-up of the Marine Security Operations Centre (MSOC). The paper also examines the Concept of Operations for the MSOC and uses a real-world operation as an example of how the MSOC is contributing to Canadian Maritime Security. The paper concludes with an examination of the lessons that have been learned after 5 years of operations and discusses some of the upcoming challenges and opportunities for North American and Global integration.

Introduction:

The events of Sep 11, 2001 changed the world forever and in ways we could not have imagined almost ten years ago. Although it was an attack on the American homeland its impact was felt around the world and resonates to this day. The picture you see here is the collateral impact of that event on the Halifax Airport, which accommodated 47 of the almost 240 aircraft that were diverted to Canada as a result of the closure of US airspace.



In essence 9/11 became the defining event that saw the former Security and Defence solitudes meld into a new blending of responsibilities and roles. As the United States introduced its institutional responses to 9/11, such as the creation of the Department of Homeland Security (DHS) and eventually US NORTHCOM, it also created an impetus for Canada to re-evaluate our Security & Defence mandates and organizations.

For Canada, this led to the promulgation of our National Security Policy (NSP) in 2004 and the creation of Public Safety Canada, which in many respects, mirrored the American DHS organization. The NSP also served to establish new and modified mandates for a variety of departments that resulted in a new “Whole of Government” approach to National Security with distinct roles and responsibilities for all departments and agencies across the defence & security spectrum.

The NSP also identified several requirements and activities that were meant to improve Marine Security. These included clarifying the roles and responsibilities for the various departments and in this regard

Transport Canada was given the mandate for overall Marine Safety and Security and was also responsible for the co-ordination of Marine policy across all departments. Public Safety Canada was responsible for enforcement and policing of Marine Security regulations, while National Defence was responsible for coordinating the on-water response to perceived or known threats or developing crises.

In addition to clarifying the mandates of various departments, the Government of Canada (GOC) also identified several initiatives to improve Marine Security within Canada and its ocean approaches, which included increasing on-water presence and aerial surveillance; establishing secure communications with all Marine Security partners; achieving greater co-operation with the US; strengthening the security of ports and marine handling facilities; and establishing three (3) Marine Security Operations Centres (MSOC), manned by inter-agency staff, to facilitate the Whole of Government co-ordination for Marine Security.

As a result, the MSOC project was established to create and develop the necessary structures, processes and technologies to provide an integrated day-to-day awareness & co-ordinated response among the federal partners and with Canada's Allies.

Maritime Security Partners

The key domestic partners in the MSOC are Transport Canada, the Canadian Coast Guard, Canadian Customs and Border Security Agency, the RCMP and National Defence. As well, the Canadian Security and Intelligence Agency (CSIS) and Public Safety Canada are also involved on a frequent basis, particularly as a response to a known or perceived threat is being planned and executed.

One of the key challenges that initially faced the project was the need to co-ordinate and develop a common operating picture (COP) for Maritime Domain Awareness (MDA) that could be used by all the partners and our Allies. In Canada no one department had ever been solely responsible for the monitoring and policing of all activity on our three oceans, rather, these responsibilities had been shared by several Federal departments.

Since Maritime threats to Canada do not necessarily fall easily into any one department's mandate, the parsing of responsibilities in the maritime domain can result in gaps between partner mandates. These gaps can be exploited by criminals and terrorists.

Although the partners have always worked well together in supporting one another in exercising their respective mandates, the strength of the MSOC is that it brings the departments together under one roof, as one team and provides them with the tools to be more effective in the execution of their mandates. In effect, the MSOCs seek to eliminate the gaps at the seams by bringing together the strengths of the partner departments to focus on Canadian Maritime Security.

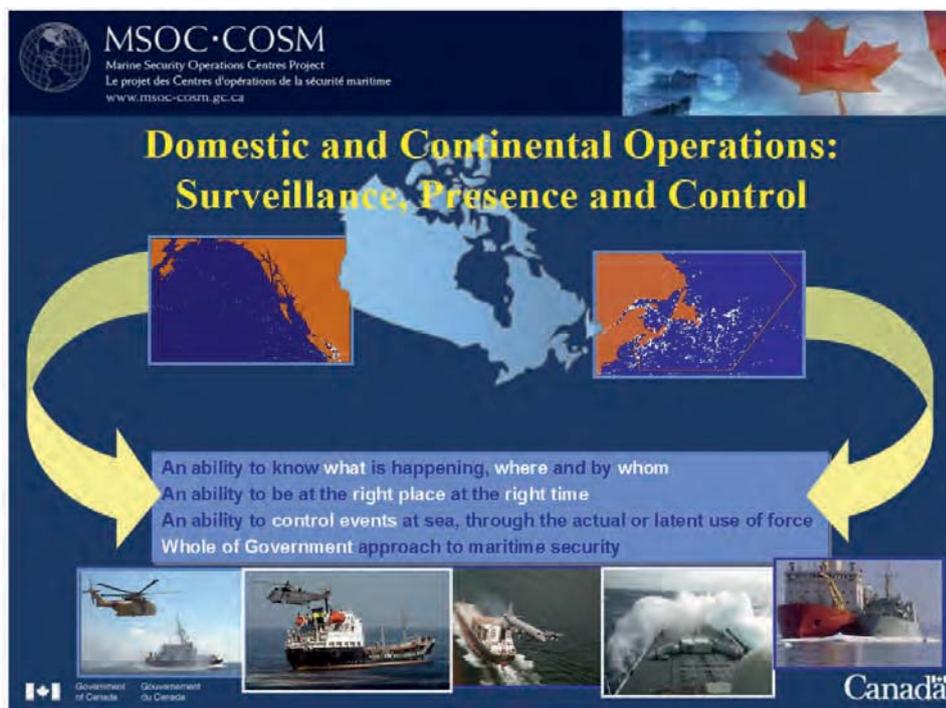
As the picture below illustrates, in addition to our national WOG relationship, we also have a close working relationship with several US and International agencies. For example our Navy and Canadian Coast Guard have an excellent relationship with the US Navy and USCG. In addition, our other MSOC partners also enjoy close agency to agency relationships with their US and International partners such as that between Public Safety and the Department of Homeland Security (DHS) or the Canadian RCMP with the US FBI and Interpol. The interesting thing to note is that many of these agencies and relationships did not exist prior to 9/11.



As a final comment on this picture, not only does it illustrate the collaboration we are engaged in on virtually a daily basis but it also serves to highlight the overlapping jurisdictions and mandates that have blurred the traditional silos between Security & Defence.

The Mission

IS for intelligence-gathering and Public Safety Canada. Although the MSOC is still under a project mandate and has not been fully implemented, it is having an impact as we use this approach to guide our decisions regarding the gathering of



What has not changed is that the primary mission is still the Defence and Security of Canada.

Our Domestic and Continental mission requires that in our own waters - in collaboration with other government defence and security partners - we maintain a constant vigilance by ensuring that we know who is in our waters and what they are doing there.

The challenge remains on how to coordinate both the incoming information and government's response. For the most part, locating traffic is relatively easy, but identifying vessels is a struggle, particularly as we try to recognize targets from the legitimate traffic and then co-ordinate the response.

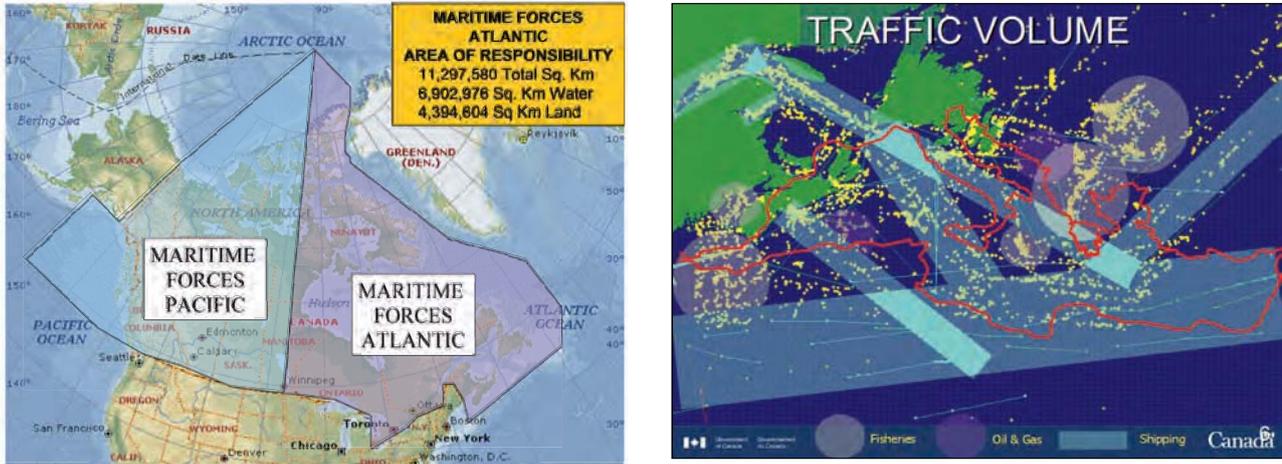
In addition, we must maintain the capability to respond to a variety of events across a broad spectrum of domestic security and defence requirements. This can range from Search and Rescue (SAR) and disaster response in direct support of Canadians in need, to armed deterrence and defence.

As was mentioned previously, there is no one department responsible for the broad spectrum of roles and missions and for the majority of the Domestic roles and missions that our Navy would be in a supporting role to the lead department. For example, the Navy would support and embark RCMP officers if necessary in responding to illegal criminal activities; or Canada Customs and Border Security for smuggling; and Department of Fisheries and Oceans for illegal fishing. In fact, it is because of the various mandates and responsibilities that we have brought these other departments together within our Marine Security Operations Centre or MSOC.

However, before we discuss the MSOC and its operation it is important to set the stage with some context concerning the challenges in the MSOC (East) Area of Responsibility.

AOR Context:

This first picture below shows the extent and size of the MSOC(E) AOR. In reality, because of the time and distance constraints from the West Coast of Canada, the MSOC(E) Maritime responsibilities actually include all Arctic Waters. Although the size and environment are impressive it is the right picture below that tells the rest of the tale by describing the nature and extent of the activity in the AOR.



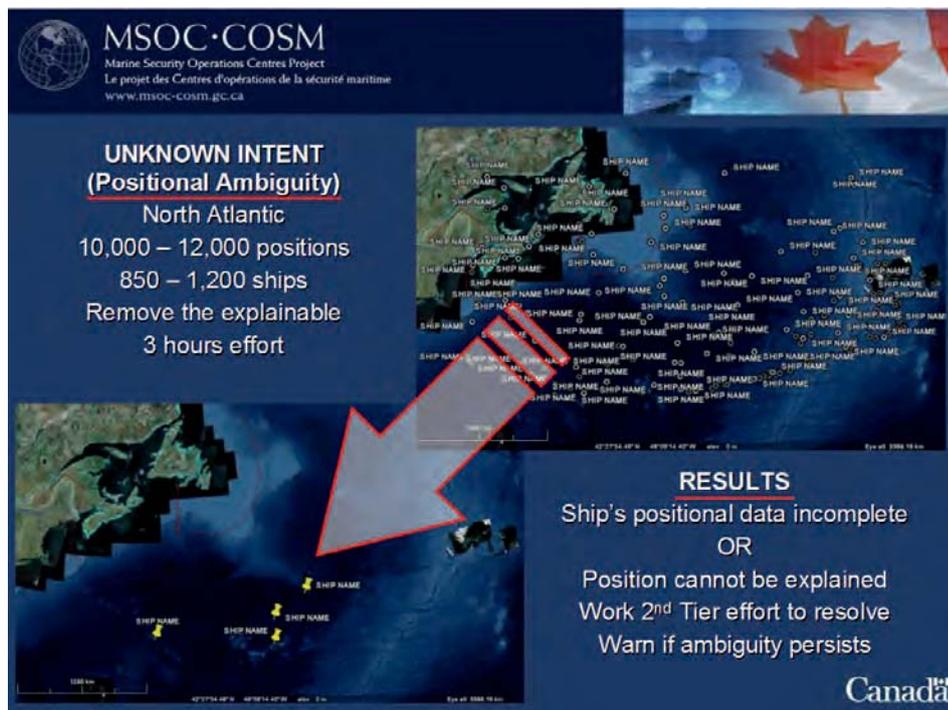
The right picture illustrates the traffic patterns and volumes for the Eastern Approaches to Atlantic Canada as well as the major fishing areas (in light grey) and the two major oil & gas zones (light purple). In order to give you an idea of the expanse we are discussing the Mediterranean Sea has been superimposed over the area in red outline.

This picture depicts some of the approximately 12,000 daily contacts that we must monitor on average and does not include the 1500+ additional contacts during the summer pleasure cruising months. Nor does it include the increasing traffic in the Arctic approaches from cruise lines, recreational boating & shipping of extracted resources.

A final point is that one of the main reasons for much of this traffic is that we are on the great circle route and as such we are the first landfall for traffic bound for the Eastern Seaboard from Europe and the Suez Canal (through the Med). In fact, fully two thirds of all traffic bound for Canada's east coast originates in Europe and the Mediterranean. This has required the MSOCs to reach out to a broad range of governmental and non-governmental agencies with involvement in the maritime trade, intelligence and law enforcement in order to establish those two way working relationships that enhance the exchange of information that is vital to maritime security. In addition, much of the traffic bound for the US east coast transits the Canadian AOR via the great circle route. This gives Canada the responsibility for a "first look" at traffic heading to the US. As a result, the MSOCs have established solid working relationships with US agencies with a maritime security focus.

The Objective

However, my primary objective is not to track all of these contacts. As the picture below illustrates, we are attempting to sift through the known contacts and reduce them to those that we are unsure of or for which we have incomplete or ambiguous data.



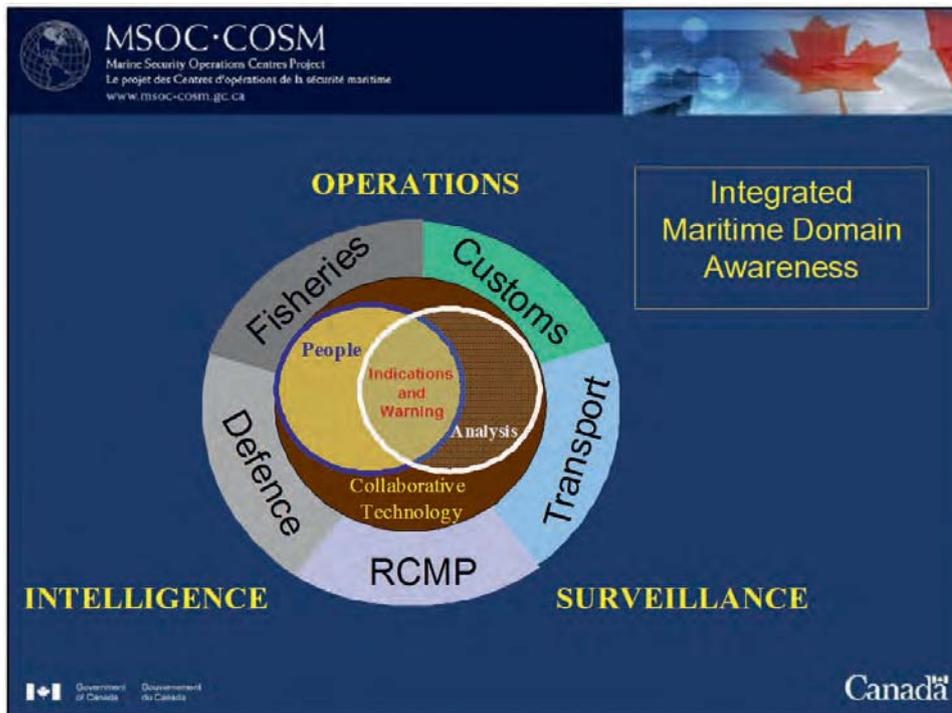
In simple terms, we start with the Recognized Maritime Picture (RMP) that has been created from the various inputs from ourselves and our partners and we conduct an analysis of the RMP to determine the intent of the vessels in our AOR. This analysis normally reduces the RMP of approximately 1200 vessels, to between one and four vessels that we do not have any insight as to their intentions. The MSOC watch keeping and analysis personnel then focus on resolving the intent of those vessels and if they are unable to do so, the MSOC Threat Risk Assessment

team (comprised of leads from each department) are convened to determine what further action is required.

This is an appropriate point to examine how we have structured the MSOC within a unifying concept that allows us to achieve our Objective – identify and respond to targets.

Integrated Maritime Domain Awareness

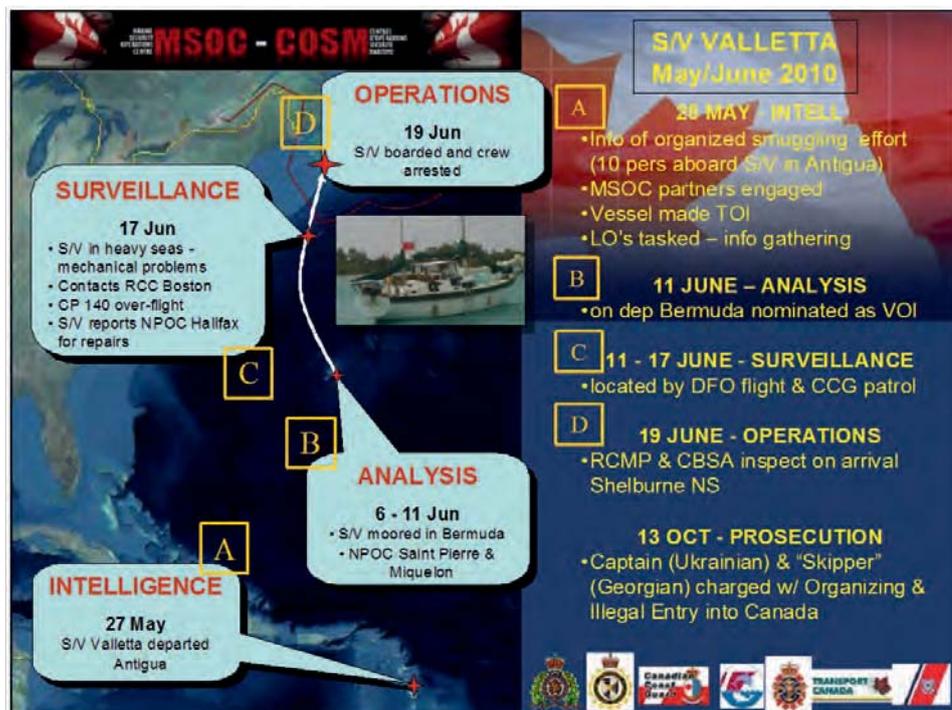
The effectiveness of the MSOC rests on three pillars; personnel (trained by their own agencies and possessing the appropriate skill sets); infrastructure and technology; and the processes that allow for the sharing and integration of information in order to produce a collaborative MDA. The collaborative MDA “picture” in turn facilitates the generation and dissemination of accurate, coherent, relevant and timely situational awareness in order to assist in the detection and assessment of marine security threats and incidents and where necessary support a coordinated response, while respecting departmental mandates and policies.



As discussed, the MSOC(E) has 5 main partners as shown here and the resources of two other key partners, the regional offices of CSIS for intelligence-gathering and Public Safety Canada. Although the MSOC is still under a project mandate and has not been fully implemented, it is having an impact as we use this approach to guide our decisions regarding the gathering of INTELL; the use of SURVEILLANCE; and the planning & execution of the OPERATIONAL response.

Let's now turn to a real-world example to better illustrate how we use our processes and approaches in an operational setting.

Op Valletta



OP VALETTA was a case of illegal human smuggling that began as an innocent pleasure cruise and is an excellent example of our “all-of-government” approach in the MSOC

On the left-hand side of the previous figure you can see the track of the vessel from Antigua at the bottom to Nova Scotia at the top. On the right hand side is a brief summary of the events and actions that correspond to the position boxes along the track.

Note how the initial Intel, led to the Analysis of intentions, which, when added with subsequent Intel, created the need for a Surveillance Plan. Eventually the Surveillance confirmed our suspicions and resulted in a successful operational response leading to the apprehension of the Crew and the illegal migrants.

The important point here is that this entire sequencing of events would not have been possible if we were working within our traditional silos and relying on a “Need to Know” philosophy of sharing info & intelligence.

Finally, the important post-script to this Operation is that the Captain and Mate were successfully prosecuted

Here is a more complete description of the events and decisions in this operation:

A INTELL - Initial info came in from a European partner

- MSOC team came together to be briefed on the available info
- NO criminal act at this time ... just knowledge of potential human smuggling
- This is an important feature to note as it meant all of the partners would be involved, not just the LEAs
- Partners commenced a search through their databases and reached out to contacts nationally and internationally
- Advised contacts at MIFCLANT in Norfolk

B ANALYSIS - Contacts in Bermuda provided info on arrival & departure of Valetta

- MSOC nominated as a VOI and socializes info with partners' leadership
- MSOC discussion as to surveillance required to locate vessel and confirm its intentions

C SURVEILLANCE - No air assets directly available to MSOC

- Called on secondary tasking of Transport Canada(TC) and PAL (contractor) assets
- Still not a criminal act so very much an MSOC surveillance issue ...
- Vessel has minor emergency and contacts RCC
- Canadian Maritime Patrol aircraft dispatched to locate
- Vessel declares for Halifax to conduct repairs
- DFO and TC flights overfly vessel enroute Halifax

D OPERATIONS - Vessel met by CBSA and RCMP and illegal migrants taken into custody

Learning from Experience

So what have we learned from 4 years of operations? Although I am sure that other practitioners in this field will not see anything that is surprising or even new, sometimes we need to appreciate and understand what appears to be obvious and keep it simple.



The slide features a dark blue background with a globe icon and a red maple leaf in the top right corner. The title 'Learning from Experience' is centered in a light blue font. Below the title, five bullet points are listed in yellow text. At the bottom left, there are logos for the Government of Canada in both English and French. At the bottom right, the word 'Canada' is written in a white serif font.

MSOC·COSM
Marine Security Operations Centres Project
Le projet des Centres d'opérations de la sécurité maritime
www.msoc-cosm.gc.ca

Learning from Experience

- **Governance Matters**
 - Roles, Responsibilities & legislative environment
- **Information Sharing is Critical**
 - Integrated Information Environment
 - Cultural barriers can be overcome through shared experiences
- **Partner participation is key enabler**
 - The right players in the right place with the right info at the right time willing and able to share.
- **Move from Need to Know**
- **Need to Share & Need to Act**

Government of Canada / Gouvernement du Canada

Canada

First of all, Governance matters. It is vitally important that each of the partners be aware of their own roles, responsibilities, mandates and enabling legislation as well as that of their partners. Next is to have the right partners in a co-located environment on a continuous basis. This will allow an appropriate “team based” culture to develop that will be distinct yet consistent with each of the “home” agency cultures. This will in turn create the conditions for trust to develop that will then lead to the robust relationships that will support open and frank exchanges of information and knowledge at the appropriate time and under the right conditions without compromising the overall effectiveness of the individual partners.

Our integrated approach allows each of the partners to still maintain their own departmental processes and chain of command which in turn allows them to contribute to the overall process without jeopardizing their sources or custody of information and chain of evidence requirements.

If you recall, OP VALETTA did result in a successful prosecution and oftentimes in a criminal situation, in order to achieve that result, we need to ensure that we maintain a proper “chain of evidence” that follows our own criminal code while also respecting the rights of the individual under our “Charter of Rights and Freedoms”. In our case, the Canadian “Charter” is a sweeping bill that significantly constrains our action but must be adhered to for prosecution to be successful. We can’t fight our reality; we must find a way to live within the constraints.

From our experience the key to success – is to provide co-location of the right partners; acting together on the right information in a commonly-shared picture; and sharing what they should at the right time.

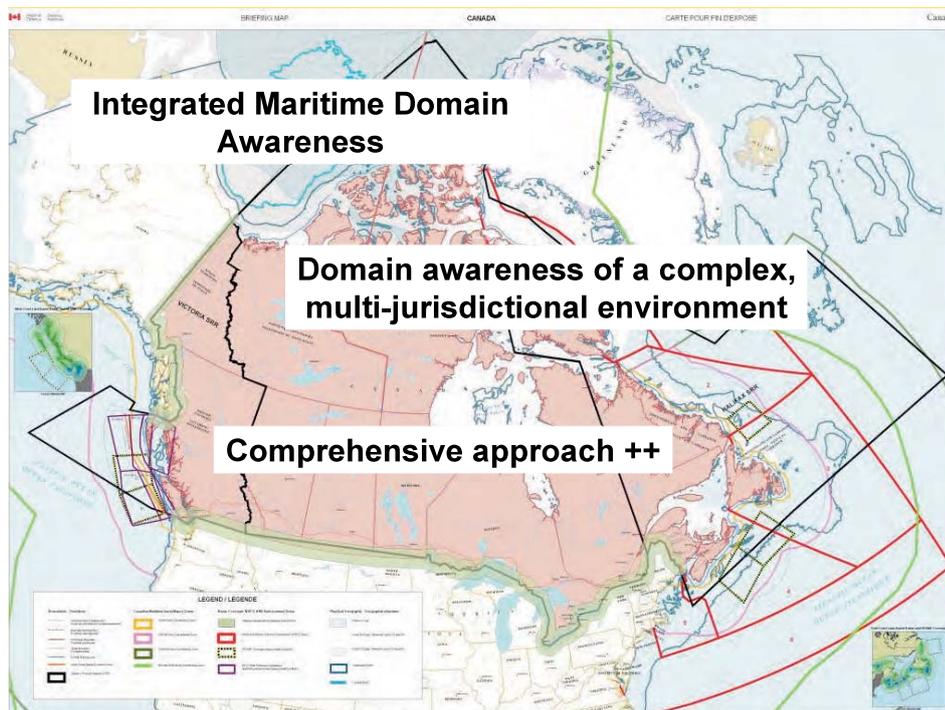
Before I conclude, I would also like to share with you where I see our future challenges and opportunities.

Future Challenges and Opportunities

From a Canadian perspective, there are two distinct challenges that we will encounter as we move towards an integrated North American and International Maritime Domain.

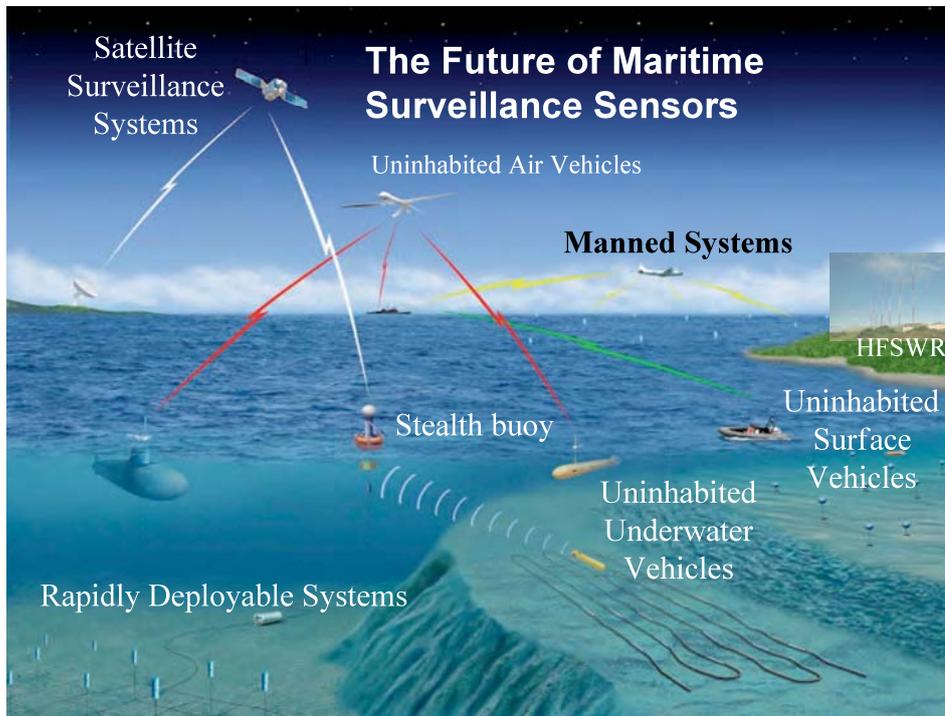
The first issue will be to determine who “owns the MSOC” and as many of you can appreciate, ownership is 9-tenths of the law. In other words it provides the over-riding mandate and creates certain expectations as a result. From my perspective, it is a subset of the larger issue which is ensuring that we have the proper enabling legislation that allows the partners to interact and share when required.

The second issue is how to achieve a more integrated picture of the Maritime Domain while still maintaining the perspectives required by the various players in the Domain. The map below illustrates some of the challenges in agreeing on a common picture to be managed as various organizations such as NAFO, NORAD, Transport Canada and International Search and Rescue, all define the water space into different regions that meet their own purposes but can create barriers or at least confusion when integrating or sharing.



This is an enlarged version of the legend for the map above.

What will further exacerbate this situation is that various organizations also experience technology development at different rates and capabilities. The picture below is one concept of how surveillance systems may develop in the future. However, as our experience with OP VALETTA and several other similar events have shown, a little bit of intelligence can often trump an awful lot of surveillance. So the trick is to develop the operating concept and processes and then use the technology in support rather than the other way around.



Conclusion

So let me conclude with what I believe is the bottom line. What we are trying to do is “Close the Seams” between our jurisdictions, our borders and our organizations to those that wish to do us harm by exploiting those same seams. The solution then has to involve a reduction in the number of seams and the ability to ensure they do not become exposed.

No one nation or organization has the ability to do it all and therefore we must not only manage the risks and consequences, but also our own expectations of what can be achieved.

In my opinion, the best ways to move forward is by integrating the most logical partners and then add as you go until the majority of the national seams have been addressed. Once this has been accomplished then the regional, hemispheric and global integration issues can be addressed.

It is important to realize that you must “eat the elephant – one bite at a time”.

Security at Sea: New Risks and Old Laws

Professor Doctor Uwe Jenisch
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Germany



Over the past years, we have witnessed that maritime violence; terrorism and piracy are continuing to spread while the international legal system of interference rights and counter-measures remains full of gaps in addressing these issues. In other words, the inadequacies of the legal system are part of the problem of security at sea.

Piracy, terrorism and the wave of political transitions in the Middle East and North-eastern Africa dominate the headlines and plague the maritime transport sector which truly is the backbone of globalization. In fact, maritime transport represents the first and foremost globalized sector of the world economy. At the same time there are other disturbing events in the larger marine environment that threaten society in different ways. Major technological disasters such as the 2010 “Deepwater Horizon” oil spill in the Gulf of Mexico or the nuclear catastrophe in Japan caused by the 2011 earthquake and ensuing tsunami are drawing public attention to further forms of environmental risk. Other critical developments such as rising sea levels attributable to climate change are highly certain to occur although uncertainty remains as to their extent. Over the next 90 years, the global average sea level rise could range between 0.4m to two meters with a most likely value of 0.8 m⁴⁸. Moreover the race for the last frontier of seabed resources in the deeper ocean has already begun.

This paper will concentrate on international legal aspects of some of the “new” maritime risks such as

- Risks arising due to seabed resources including controversial (or excessive) maritime boundary claims
- Natural disasters and climate change
- Security of communication - sea lanes and cables.

The risks of piracy and terrorism at sea will only be touched upon here when necessary. Also, the rights of a state under the UN Convention on the Law of the Sea (UNCLOS)⁴⁹ to enforce its laws and prosecute illegal acts committed inside its own zones of national jurisdiction⁵⁰ or the *duty* of all ships to render assistance to persons in distress⁵¹ will be largely left aside.

Instead, this essay will discuss a few typical incidents and risks in the categories mentioned above. Needless to say that those in command of the naval assets should be aware of these (and all the other) security risks.

1. Risks over Marine Mineral Resources (MMR)

The world economy, still recovering from the financial crisis, is currently experiencing increasing commodity prices. Industrial associations and governments are monitoring patterns of supply and demand, not only for standard minerals like iron and aluminium, but also for high value metals (e.g. nickel, copper, titanium, gold) and rare earth elements (REE) like indium, gallium, neodymium, and germanium which are important for semi-conductors, photo-voltaic, lasers, liquid crystal displays, fibre-optic cables and other high-tech products used in both civilian and military applications. Demand for raw materials is expected to double in the next 25 years. The EU has identified a list of 14 out of 41 critical raw materials⁵² which are irreplaceable in key industries. The supply risk is due to the fact that a high share of production comes from China, Russia, South Africa, the Democratic Republic of Congo and Brazil. This production concentration cannot be substituted for or augmented by other sources, nor can these resources be obtained from recycling. The political-economic

⁴⁸ For 2050 AWI Institute (Bremerhaven) predicts 32 cm due to dramatically increased ice melting on the Northern hemisphere; actual (2010) increase worldwide 1.3 mm/y. Some scientists argue for as much as 2 m.

⁴⁹ United Nations Convention on the Law of the Sea (UNCLOS) of 1982, in force since 1994 and binding upon 161 States parties (2010); articles quoted hereinafter without further details are those of UNCLOS.

⁵⁰ Arts. 2, 27 and 28 (criminal and civil jurisdiction in the territorial sea); Arts. 218, 224 – 233 (port state enforcement); Art. 217 (flag state enforcement); Art. 111 (hot pursuit).

⁵¹ Art. 98.

⁵² EU MEMO/10/263 of 17 June 2010; see also EU raw materials initiative COM (2008) 699 final of 04 November 2008.

stability of some of the producing States is questionable, and, in the case of Congo, nearing collapse. The list of failing states will grow where humanitarian and environmental risks may get completely out of control. The risks for the supply chains are self-evident: old and newly industrialized states are competing over prices and access rights to the remaining raw materials, while the low hanging fruits have been picked. As a consequence, interest in **marine mineral resources** is growing again. With only 29 % of the world's surface being land and 71 % being sea, there is every reason to believe that terrestrial minerals occur in deposits on and in the seabed, as well. The Pacific Ocean alone is larger than all land masses on earth.

Offshore oil and gas is a success story in itself, as we all know. The sophisticated underwater technology of the offshore industry (floating production units, collectors, risers, pipe systems, robots, AUVs) can be adapted to ever increasing water depths. The next step will be the mining of mineral ores and rare earth elements. At least five different types of marine mineral deposits can be distinguished:

- Manganese nodules (deep seabed 3-6000 m, mostly in international waters);
- Seafloor massive sulphide deposits (SMS) (Cu, Zn, Pb, Au, Ag) on submarine volcanic sites (est. 1000 "black smokers"), at 100 – 4000m depth;
- Polymetallic crusts (Mn, Co, Ni, Pt) on volcanic seamounts 800-2500 m;
- Hot brines (Cu, Au, Ag and others) in the Red Sea trench (Atlantis II Deep); and
- Diamonds and rare sands in shallow waters, at 90 – 140 m depth off the coast (Oranje river, Namibia).

Minerals and the Law of the Sea

Minerals from the seabed cannot replace terrestrial mining but marine minerals can complement the supply and make industry independent of critical suppliers to the extent that costs and technology allow it to do so. According to many experts, the break-even point is near, while the legal-political conditions are favourable. Beginning in this decade we will see a new "rush and grab" of competing interests going subsea and the big questions are:

- Who owns the minerals?
- Who has the right to access?
- Who is responsible for environmental protection?

Basically, there are two different approaches to seabed mining under the UNCLOS regime:

- **Inside the 200 nm EEZ** (or on the outer continental shelf) resource rights are exclusively those of the coastal State. Exploitation is possible only with the consent of that State; and
- **In the international area** outside the limits of national jurisdiction, called "The Area" under the regime of the International Seabed Authority ISA, based in Kingston/Jamaica.

Like in the case of offshore oil and gas it is logical to assume that the future extraction of minerals begins inside the EEZ of 200 nm, where the coastal state has "sovereign rights of exploring and exploiting, conserving and managing the natural resources, whether living or non-living" and jurisdiction over artificial islands, installations and structures. In this case the domestic legal system of the coastal state is applicable which means that mining law, tax law, licensing system, environmental law etc have to be observed. The mining company based in state A can mine in the EEZ of state B on the basis of a licence, of a joint venture agreement or any other bilateral arrangement.

Bilateralism is the model case. States with rich deposits in their EEZ – e. g. tiny island states (Fiji) and states with long coast lines (Chile) – find themselves in a good bargaining position - or may become the target of a big and powerful state in need for raw materials.

The following examples demonstrate that the race has just begun. The Toronto-based Nautilus Minerals Inc.⁵³ received its first production-license for the "Solwara 1" project from Papua New Guinea in January 2011 and has pending applications for the EEZ of Fiji and other places. Sydney-based Neptune Minerals is exploring the seabed off New Zealand and De Beers of South Africa, an offshore diamond miner, is adapting its

⁵³ www.nautilusminerals.com

technology for similar projects in the Coral Sea⁵⁴. The US Geological Service is working on an inventory of the seabed riches of Pacific territories and associate states in the area. A poor Pacific island may become a bonanza. A tiny island or a reef and a rock may become the trigger of a maritime clash, ending up in an incident or a military occupation.

Mining on the Seabed in Contested Zones

Thus the significance of marine space under national jurisdiction is increased once again as hard minerals are entering the scenes. The increasing competition for natural resources poses considerable conflict potential. It can destabilize already fragile states and regions. It comes as no surprise that states will try to nationalize as much sea space as they can. For this purpose they will make maximum use of the UNCLOS toolbox consisting of expanded base lines, territorial sea limits, contiguous zones, EEZs and outer continental shelf zones. Conflicts over sea borders which calmed down in the past will boil up again.

The best collection of the maritime boundary practice of states is the 6-volume publication “International Maritime Boundaries” by Colson/Smith⁵⁵ with some 240 boundary reports and maps including regional reports of sensible seas like the Mediterranean, Baltic, Red Sea/Persian Gulf, Caspian, Caribbean and others. However, an estimated minimum of 100 maritime boundaries in the World are still disputed or otherwise unresolved. The ingredients of a maritime border conflict are always the same: territorial claims, resources and sea lanes.

While some regional seas like the North and Baltic Seas and the Caribbean are divided up by longstanding maritime boundaries, others like the Mediterranean and the South China Sea are largely unregulated. For example there is only one isolated short median line agreed upon between Cyprus and Egypt and some 70 n.m. of a southern border of Lebanon’s EEZ with Israel⁵⁶. The rest of the South-eastern part of the Mediterranean is a bone of contention between Turkey, Syria, Cyprus, Lebanon, Egypt, Israel and the future Palestinian state (Gaza?) where gas fields (Leviathan, Gaza Marine) have been discovered and licenses been issued. The salient problem is the delimitation of the maritime zones which could be attributed to Israel on the one hand and to the **Gaza territory** on the other: The conflict of Israel and its neighbours has a maritime dimension, largely underestimated for a long time. It came to the surface when Israel seized the containership “Victoria”⁵⁷ in international waters 300 kilometres off the coast on March 15, 2011 accusing the vessel of carrying radar-guided missiles of Iranian origin destined for the Hamas militia in Gaza. Israel presented these arms in the port of Ashdod to foreign diplomats. Without going into the details a legal basis for seizing arms (contraband) carried on neutral ships during a military conflict could be the right of sea blockade⁵⁸.

Another current conflict refers to the uninhabited **Senkaku (Diaoyu) Islands** which are claimed by Japan, China and Taiwan in an area where fishing grounds and gas fields overlap. When the Japanese coast guard arrested a Chinese fishing boat in 2010 China used the incident to impose permanent export restrictions for trace metals. Needless to say that also the neighbouring South China Sea is politically a hot spot⁵⁹ where a military confrontation builds up. It is a regional sea of three million km², of which 80 % is claimed by China.

The unlimited boundaries in the **Red Sea** represent another complex situation where Egypt, Sudan, Eritrea and Saudi Arabia have failed to agree on a median line separating the Red Sea into a western and an eastern part. The situation is further blurred by excessive baselines, disputed islands and contested land borders among the neighbouring states of the region and by extremely rich mineral resources on the seabed. In the 1960’s high concentrations of copper, lead, zinc, gold and silver in the form of hot brines and metalliferous sediments have been discovered in the deep central parts of the Red Sea. Large amounts of material were

⁵⁴ Wall Street Journal of 06.11.2009.

⁵⁵ David A. Colson/Robert W. Smith. International Maritime Boundaries. Vol. I – VI, Martinus Nijhoff Publishers, Leiden/Boston 1993 – 2011, 4779 p.

⁵⁶ The Lebanese declaration (and map) of 2010 uses the wording “Southern Median Line (Lebanon – Palestine)”, LOS Bulletin no. 73, New York, 2011, p. 39 -42.

⁵⁷ German owned vessel under the flag of Liberia, chartered by CMA/CGM on its way from Latakia (Syria) via Mersin (Turkey) to Egypt. See: FAZ of 17 March 2011.

⁵⁸ San Remo Manual (1994), sect. 67 a.

⁵⁹ Secretary of State Urges Multilateral Approach to China’s South China Sea Claims, AJIL Vol. 104 (2010), no. 4, p.664 – 666.

recovered at that time. A pre-mining test was planned, but never implemented. In 1974 Sudan and Saudi Arabia signed an agreement relating to a joint development zone⁶⁰ under the management of the Saudi-Sudanese Red Sea Commission. The joint zone was established in the absence of a boundary agreement. It covers the whole seabed of the Red Sea between the two states which lies beyond the 1000 m isobaths⁶¹, but the northern and southern limits are not defined. All exploration work came to an end in the late 1970's and there is very little information about activities in the area since then.

But in 2010, after consultations with Sudan, Saudi Arabia awarded an exclusive mining licence for 30 years over the richest deposit known as the **Atlantis II Deep**. The Manafa Inc., an investment holding company active in the Middle East since 2003, could be among the first deep sea mining operators. It remains to be seen whether the old joint development agreement with Sudan can be reactivated if and when a lucrative mining operation starts⁶². Optimists will hint at some UNCLOS rules such as art. 123 which encourage a close cooperation of states in semi-enclosed seas like the Red Sea. Also articles 74 (3) and 83 (3) may be invoked here with the option for states to enter into provisional arrangements when a boundary agreement has not yet been agreed upon⁶³. A median line with an extent of more than 300 n. m. in the middle of the Red Sea would appear to be equitable. But in all likelihood, and in view of rising metal prices, a massive border conflict between Sudan and Saudi Arabia is to be expected. A first sign of conflict is Saudi Arabia's declaration of straight base-lines in the Red Sea⁶⁴ to the effect that a median line has to be moved westward at the expense of Sudan.

Mining interests in outer continental shelf zones – the Arctic Ocean

The worldwide problem of contested islands and maritime borders is further complicated through the current process of delimitation of "**outer continental shelves**". According to the criteria of article 76 states may claim a continental shelf beyond the 200 nm limit, wherever the continental margin extends in geological terms beyond the 200 nm limit. If the geological criteria are met the Commission on the Limitation of Continental Shelf (CLCS) can fix the lines at an outer limit not exceeding 350 nm or 100 miles from the 2500m isobaths⁶⁵. Until March 2011 the CLCS, based in New York, has received 54 applications from some 45 states. There are estimates that a total of more than 70 applications can be expected. Some of the most spectacular claims refer to large ocean spaces in the Arctic (Russian claim of 2001 to include the North Pole) and in the Indian Ocean (French/Australian claims on the Kerguelen ridge). The Pacific Ocean deserves special attention because a cascade of outer continental shelf claims has been tabled by New Zealand, the Solomon Islands, PNG, Fed. States of Micronesia, Fiji, Vanuatu and the Cook Is., Kiribati and Tuvalu.

The **Arctic Ocean** is currently at the center of the outer continental shelf discussion. In fact, the Arctic is becoming the test bench for international politics. It is an Ocean where oil and gas, minerals, fisheries, sea lanes, military interests and governance over ocean spaces meet in conflict among the five 'frontline' states (USA, Canada, Denmark/Greeland, Norway and Russia) while other neighbouring entities like Iceland, the EU, Japan and China express their Arctic interests as well. All this happens at the same time when Arctic temperatures are rising twice as fast as in the rest of the world⁶⁶ and climate change becomes incalculable.

The warming temperatures break up polar ice, raise sea levels, and potentially cause international conflicts as the Arctic becomes accessible at least during the summer. The United States, unlike the other Arctic states, is falling behind in this contest with little or no icebreaking and naval capacities in the region. Moreover, the US, having not ratified the Law of the Sea Convention, is not in a position to claim outer continental shelf areas nor having a say in the ISA which will be responsible for deep-sea mining in the Arctic.

⁶⁰ Saudi-Sudanese Agreement of 1974 Relating to the Joint Exploration of Natural Resources of the Sea-bed and the Sub-soil of the Red Sea.

⁶¹ Victor Prescott/Clive Schofield, *The Maritime Political Boundaries of the World*, 2005, p. 487-489.

⁶² For an update of the situation see: Christine Bertram et. al.: *Metalliferous Sediments in the Atlantis II Deep*, Kiel Institute for the World Economy, Kiel working papers no. 1688, March 2011, 30 p.

⁶³ David A. Colson/Robert W. Smith, *International Maritime Boundaries*, Vol. V, 2005, p. 3468 -3470.

⁶⁴ Law of the Sea Bulletin no. 72, New York, 2010, p. 81 – 86 with text of declaration and maps.

⁶⁵ The first eleven recommendations of the CLCS are available at www.un.org/Depts/los/index.htm

⁶⁶ The temperature of Atlantic currents inflow into the Arctic (Fram Strait) are 2° higher than usual; www.ifm-geomar.de

Summary

With a view on the maritime dimension of conflicts over (seabed) resources a few circumstances⁶⁷ have to be met before the break-out of a real political/military confrontation at sea:

1. The existence of valuable marine resources in disputed waters, e. g. in an EEZ which is claimed by two or more enemy states;
2. A drastic general increase of commodity prices and a lack of alternative supplies;
3. A threat of a monopoly and/or a declared or undeclared embargo;
4. Public/political awareness of the conflict; and
5. Failure of international governance instruments for dispute settlement (WTO, G20, international courts, arbitration).

The **legal instruments** to solve this type of maritime conflict are basically in place. A large number of notorious conflicts have been settled by means of border agreements⁶⁸, decisions of international courts or – in rare cases – also by the establishment of joint development zones where two states closely cooperate. With a bit of goodwill on behalf of governments there is a variety of solutions available. The LOS Convention offers criteria for the delimitation between states with opposite or adjacent coasts for territorial seas, exclusive economic zones and continental shelves⁶⁹. Under Article 287 there is a choice of procedure for binding decisions of different international tribunals, like the LOS Tribunal in Hamburg, the ICJ in The Hague or ad hoc arbitral tribunals⁷⁰. Even though the law to mediate border conflicts exists we see a growing number of serious disputes. In many cases the political will of states to resort to existing procedures is missing because valuable resources, access rights to ports and sea routes or protracted hostility between neighbouring states are in the way of a peaceful solution. In such cases only good governance and wise politicians can help to avoid a military confrontation.

These requirements – and/or similar ones - may be typical for the emergence of “classical” international conflicts at sea, involving two or more states. But there are other developments where the underlying causes arise from inner state conflicts that may trigger a real international conflict as well:

1. The piracy off Somalia, based originally on the local problems of a failing state, involves the international community when criminals operate in international waters.
2. The revolution in Libya provides an example of a state where the rich revenues of its oil and gas production end up with a corrupt dictator leaving the population starving and without human and political rights. If the community of states decides to intervene for humanitarian reasons, they are confronted with complicated questions of international law. First and foremost a legal basis for intervention is needed before the wide spectrum of reactions can be implemented, ranging from humanitarian aid, evacuation, risky helicopter missions and no fly zones down to military intervention with ground forces.
3. Sierra Leone with its “blood diamonds” and Congo with its rare earths finance endless civil wars which destabilize the whole region and sooner or later trigger international conflicts.

2. Natural Disasters and Climate Change

To complete the picture of “new” risks at sea which have a massive legal (and territorial) impact, a brief hint at conflicts related to climate change has to be added here. Earthquakes, tsunamis and floods are among the extreme weather events that hit modern societies unexpectedly “out of the blue”. With a view to climate change we may expect more and more serious disasters to happen. Governments and society are normally

⁶⁷ See also: Stormy Annika Mildner et al. (eds.). *Konfliktrisiko Rohstoffe? Herausforderungen und Chancen im Umgang mit knappen Ressourcen*. Berlin, SWP Studie 2011/S of 05 February 2011, 228 p; english version: *Resource Scarcity – A Global Security Threat ? SWP Research Paper RP 2*, March 2011, 30 p.

⁶⁸ see above Fn. 8.

⁶⁹ Arts. 15, 74 and 83.

⁷⁰ Barbara Kwiatkowska, *Decisions of the World Court Relevant to the UN Convention on the Law of the Sea*. 2nd ed. 2010; Kyriaki Noussia, *On International Arbitrations for the Settlement of Boundary Maritime Delimitation Disputes from Joint Development Agreements for the Exploitation of Offshore natural Resources*. *IJMCL Vol. 25* (2010), p. 63 - 82.

ill-prepared in their civil defence efforts. They react too late, feel the fragility of human life and complain over non-existent provisions. A new and secondary role in disaster reaction emerges for the armed forces. They are among the few services that can intervene at short notice with manpower, vessels, helicopters, air transport, heavy equipment and communications. For the lawyer the new topic is “disasters and law” with little or no legal framework so far.

As regards the rising sea level massive legal consequences may be anticipated when states lose their territory, totally or in part. The loss of agricultural land and water supplies undermine the living conditions of low lying coastlines, estuaries and small islands.⁷¹ If the coastline moves the baselines have to follow. Considerable unrest can be expected when existing maritime boundaries must be shifted due to the loss of territory⁷². In the case of small island states, these states may disappear completely. As a consequence, maritime zones such as the territorial seas and EEZs could be significantly altered or even reversed into high seas. What happens when a state disappears? How can the homeless inhabitants be compensated? Here, the law of succession of states is confronted with the law of the sea, with unknown solutions. At least in the case of shifting maritime borders among neighbouring states a conflict could theoretically be mitigated by using a range of existing tools such as joint development zones or renegotiating borders in the sea.

In these cases where the underlying reason is not an international conflict there is little or no law available. New law is needed and states have the choice between new regional (multilateral) law or universal new law – preferably through the United Nations. It is worthwhile mentioning that in the current case of Libya, as in earlier domestic conflicts, the United Nations Security Council⁷³ manifestly expressed its responsibility for the protection of the civilian population of a state in distress. Resolutions of the Security Council taken by unanimity allow for military/naval intervention by outside powers. This idea will be taken up at the end of this paper after looking into another risky area – that of communication.

3. Security of communication – sea lanes, cables and pipelines

In the rapidly changing globalized world of today 90 % of international transport is sea-borne, while old risks and new risks coincide. Major shipping and pollution accidents will continue, though at a reduced rate, because the maritime safety legislation of IMO is more and more implemented and controlled by flag states and port states. Thus maritime safety seems to be well on the way while maritime security is on the focus now. Piracy and terrorism are contemporary challenges and in some instances we see piracy and terror acting jointly.

With chaos erupting in the Arab world, and possibly also in other authoritarian states, we must not forget, that maritime rescue operations will happen to evacuate foreign citizens and other civilian refugees (non-combatant evacuation). To meet these challenges military and civilian vessels and aircraft will be needed at short notice and in close interaction.

At the same time we must realize that traditional shipping lanes are changing. Traditionally, the routes across the North Atlantic, the North Pacific and the Indian Ocean linking the industrial centres of East Asia, Europe and North America were dominant. This is changing due to several developments:

- The rise of Brazil, the Russian Federation, India, China (the “BRIC” states) and South Africa and certain Emirates.
- Much more cargo will be moved around the equator, through the Panama Canal and in the Southern hemisphere, where port infrastructure and canal infrastructure is booming.
- More raw material transports from Latin America, South Africa and Australia will add to this scenario.
- The Polar sea routes around the Arctic and in Antarctica (cruise ships!) will be used more frequently.
- Regional seas like the Baltic and the Mediterranean will see more traffic⁷⁴.

⁷¹ German Advisory Council on Global Change (WBGU), *Climate Change as a Security Risk*. Earthscan, London: 2008.

⁷² Katherine J. Houghton et al. *Maritime boundaries in a rising sea*. *Nature Geoscience*, Vol. 3 (2010), p. 813 – 816.

⁷³ UN S. C. Res. 1973 (2011) of 17 March 2011 urging states to implement a no fly zone, an arms embargo, freezing of assets etc. in Libya.

⁷⁴ There are some 230 ferry lines in European waters. *Fähren, Routen, Reedereien, Verband der Fährschiffahrt und Fährtouristik e. V.*, Hamburg 2011.

- The cruise industry increased by 50 % between 2006 and 2010. More than 500.000 passengers and crew are embarked on cruise ships every day.

The volume of trade and the number of passengers will increase as the economy recovers and Asian development continues to progress at an unprecedented speed. If, in the future, air transport comes under fire due to its negative influence on the climate, sea transport may get an additional boost. As new trade routes and opportunities emerge, the cumulative effect of these developments is that security at sea must be guaranteed in new regions – often with new hotspots and far away from the traditional (Northern) centres of gravity. Uncertain times lie ahead.

Canals, tunnels and bridges over straits, submarine pipelines and cables serve communication and transport purposes in the widest sense. These types of marine infrastructure can easily become targets of terrorism⁷⁵. It may be recalled that millions of telephone, telex, TV and data links are made across the world at every moment of every day. They may travel on radio waves or via satellites but the majority are transmitted by submarine cables, which form a network over the world's sea beds. Cables are special because they provide a privacy and security that radio and satellite lack. They are reliable, long lasting and have an excellent capacity and transmission quality. Cables are vitally important to the global economy, to national security and to the safety of life⁷⁶. The modern version of these arteries of data flow is fibre optic cables running through oceans, straits and across land bridges. For example the bulk of data flow between Europe and the Far East goes by fibre optic cables that run from the Mediterranean through Egyptian territory into the Red Sea and the Gulf of Aden. A high concentration of cables can be found in the South China Sea, Red Sea and Mediterranean Sea. Thus the protection of "critical" marine infrastructure is part of the agenda.

Regarding the protection of cables and pipelines the law of the sea is incomplete. On the one hand, all States enjoy the right to lay, to maintain and to repair cables and pipelines in the EEZ, on continental shelves and in archipelagic waters of a foreign State⁷⁷ and in high seas areas⁷⁸. This would not include the right to actively protect these submarine installations by military means, except in the case of self defence against an imminent attack. With this exception all policing rights of protection inside zones of maritime jurisdiction rest with the coastal states which have to adopt national laws to protect cables. In the case of damage to cables and pipelines the normal remedy would be liability and compensation by those who are responsible for the damage.

4. A Way Ahead: Resolutions under Chapter VII of the UN Charter

As a rule national (domestic) law allows for intervention and prosecution at sea only in national waters or, in international waters, against nationals of that state or ships under that flag. Additionally, UNCLOS declares a few offenses⁷⁹ like piracy, trafficking in drugs and slaves *on the high seas* as internationally outlawed offenses which *may* be prosecuted by warships. Warships *may* prosecute these offenses as an option, but do not have a *duty* to do so. Thus the fight against piracy is a voluntary (discretionary) task while terrorism is not even mentioned in UNCLOS. These are among the main gaps in the law of the sea.

Here, the growing role of the Security Council as a "world legislator" has to be noted⁸⁰ against the traditional perception that (only) states are the legislators in the international legal system. In fact the UN Security Council stepped in on various occasions and expanded the law through unanimous resolutions under Chapter VII of the UN Charter⁸¹ in order to maintain and protect *international peace and security*. The Security Council enjoys a wide discretion when to decide that a conflict, be it an international or even an inner state conflict, constitutes a threat to international peace and security. Decisions of the Council which require unanimity may go as far as military intervention and are binding upon all UN member states⁸².

⁷⁵ UN General Assembly Res. "Oceans and the Law of the Sea", A/65/37 of 17.03.2011, p. 3-4 and no. 121.

⁷⁶ For further details see: Kingfisher Cable Awareness Chart, North Sea Central, December 2010.

⁷⁷ Arts. 58 (1), 79 and 51 (1).

⁷⁸ Art. 87 (2).

⁷⁹ Arts. 98 – 111.

⁸⁰ Stefan Talmon: The Security Council as World Legislature. AJIL, Vol. 99 (2005), p. 175.

⁸¹ Arts. 39 – 51 UN Charter.

⁸² Rüdiger Wolfrum (ed.), Handbuch Vereinte Nationen, München 1991, p. 764 – 771.

Anti-piracy resolutions

Concerning piracy off Somalia a series of Security Council resolutions⁸³ opened up the ways and means to combat piracy “inside the territorial waters of Somalia”, to use “all necessary means” and ultimately also to act “in Somalia”, thus expanding the anti-piracy regulations of UNCLOS considerably. Most of these resolutions also urge states to criminalize piracy under their domestic laws and to improve the procedures to bring pirates to justice by national courts and/or regional/international courts.

A similar series of resolutions refers to the fight against terrorism. In this case the Security Council referred additionally to the concept of *self-defence*. And in fact self-defence can be a legal basis to respond to maritime violence in international waters. Among the fundamental rights of states self-defence is enshrined in the Charter of the United Nations in chapter VII within the framework of actions with respect to threats to peace and acts of aggression. Art. 51 of the UN Charter reads:

Nothing in the present Charter shall impair the inherent right of individual and collective self-defence if an armed attack occurs against a Member of the United Nations, until the Security Council has taken measures necessary to maintain international peace and security.

The Charter defines the right of self-defence in a restrictive way. Art. 51 limits the right of self-defence to cases of an illegal armed attack as distinct from an ordinary breach of international law. In the first place it has to be an armed attack that must be real, imminent and overwhelming leaving no other choice of reaction. The attack must be a threat to international peace and security. A threat of attack is not sufficient so that pre-emptive self-defence is illegal. The defensive countermeasures have to meet the test of proportionality to avoid excessive defence. The right of defence is available only to a State which defends its rights against another aggressor who is a state as well. Thus the normal case of self-defence will be a military attack countered by military force of the defender. Finally, self-defence is only possible for war-ships and government ships.

In the case of modern security risks, such as piracy and terrorism, the aggressor is a non-state actor since pirates are largely “normal” criminals with the aim of opportunistic economic gain rather than political ends. Terrorists and insurgents may be politically motivated but normally are not the representatives of an existing state. Thus the traditional concept of self-defence cannot be invoked directly by state authorities in their fight against non-traditional – or asymmetric – attacks or threats.

Anti-terror resolution 1373

In the fight against terror, UN Security Resolution 1373 (2001)⁸⁴ adopted by unanimity and thus binding upon all UN Member States, broke new ground and established steps and strategies to combat international terrorism by non-state actors. Most importantly, this resolution reaffirms that terrorism as such constitutes a *threat to international peace and security* with the consequence that the right of individual or collective self-defence is applicable⁸⁵. Under the terms of the text, the Council further imposes the *duty* of states to implement domestic anti-terror laws and regulations with regard to the prevention and suppression of terrorism in the domain of financing, prosecution and criminal jurisdiction, traffic in arms, border controls, exchange of information, laws of asylum seekers and refugees and other areas of organised crime.

Therefore, warships and other government ships are allowed to act against terrorists on the basis of art. 51 UN Charter because Res. 1373 brings terrorist acts in line with an armed attack of a hostile state, the only condition being that the attack by terrorists be the equivalent of an armed attack.

WMD Resolution 1540

A similar idea can be found in Res. 1540 (2004)⁸⁶, commonly referred to as the “WMD Resolution”, requires

⁸³ UN S. C. Res. 1814 (2008), 1816 (2008), 1838 (2008), 1844 (2008), 1846 (2008), 1851 (2008), 1897 (2009), 1918 (2010), 1950 (2010), 1976 (2011).

⁸⁴ UN S.C. Res 1373 (2001), adopted unanimously on 28 September 2001.

⁸⁵ See. Res. 1368 (2001) and preamble and no. 5 of Res. 1373 (2001).

⁸⁶ S/Res/1540(2004) adopted by the Security Council at its 4956th meeting on 28 April 2004 and extended by S/Res/1673(2006) for another two years.

all states to criminalize the proliferation of weapons of mass destruction (WMD), enact strict export controls and secure all sensitive materials within their borders.

It may be recalled that Resolution 1540 had been triggered by the **Proliferation Security Initiative (PSI)** of the United States. As a response to the growing challenge posed by weapons of mass destruction, their delivery systems and related materials, the US Government started the PSI Initiative in 2002 and presented it publicly in May 2003⁸⁷. However, PSI is not a legal instrument, nor an international organization, but rather a process of voluntary government co-operation to raise security awareness and take steps to stop the flow of such items at sea, in the air or on land. More than 10 “core members” and some 70 participating states committed to this political process.

These ideas got a legal quality when the Security Council incorporated them into Resolution 1540. Under no. 10 this text calls upon all states to take co-operative action to prevent illicit trafficking in WMD weapons, their means of delivery, and related materials. Again this resolution is based on Chapter VII. Its preamble recalls the right “to take appropriate and effective actions against any threat to international peace and security” and expresses concern over the risks of non-state actors and terrorists. Moreover, the text offers a definition of a non-state actor as an “individual or entity, not acting under the lawful authority of any State on conducting activities which come within the scope of this resolution”. Resolution 1540 provides no new enforcement authority as it concentrates on the behaviour of states. But as a minimum the wording of resolution 1540 is clearly hinting at the right of self-defence against WMD activities by non-state actors thus expanding again the right of self-defence which originally only applies if an armed attack occurs by a state.

New rules for boarding of suspected vessels

An interesting by-product of these anti-terror initiatives are new rules for boarding and inspecting suspected foreign-flag vessels. Since 2004, the United States has concluded *bilateral* ship-boarding agreements with eight States⁸⁸, representing some 75 % share of world tonnage. Such agreements typically allow two hours to deny U. S. personnel the right to board a ship. But again there are gaps. The agreements may allow for boarding, but not necessarily for cargo seizure. Cargo can only be seized in port, if the laws of the port State are violated.

A multilateral convention with innovative boarding rights is the Protocol of 2005 of the Convention for the Suppression of Unlawful Acts Against the Safety of Maritime Navigation, better known as the **SUA Protocol of 2005**⁸⁹. The negotiating forum was not the UN Security Council but IMO, *the competent international organisation*, as it is named throughout the Law of the Sea Convention in all aspects of maritime safety and environmental protection. The new protocol entered into force on July 28, 2010 after being ratified by a minimum of 12 states. The original SUA Convention of 1985, in force for some 140 states now, was negotiated in response to the hijacking of the “Achille Lauro” and deals with the criminal prosecution of offenders. The 2005 Protocol, pushed by the US in the wake of 9/11, establishes a variety of new offenses of violence at sea, mostly related but not restricted to unlawful carriage, use, or operation of WMD materials against vessels and platforms.

The new SUA Protocol also covers cooperation and procedures for boarding vessels under a regime of “**consensual boarding**”. The details are to be found in the 15 paragraphs of art. 8bis. If a warship of a requesting state encounters a suspect vessel under the flag of another state party outside any territorial sea, i. e. in an EEZ or on the high seas, it may request the flag state’s authorisation to board and take “appropriate measures”. In that case the flag state shall either authorize or deny boarding. If the flag state does not grant the request, the requesting state must not board. However, under paragraph 5 (d) and (e) of art. 8bis the flag state may under two different modalities waive its right to grant consent by a formal notification to the Secretary-General of IMO in the interest of facilitating boarding. The first option is an “automatic consent” if the ship’s nationality is not confirmed within four hours. The second option is a blanket pre-authorization⁹⁰ without the four-hour rule.

⁸⁷ Congressional Report Service, CRS Report for Congress: Sharon Squassoni, Proliferation Security Initiative PSI, Updated September 14, 2006.

⁸⁸ Panama (2004), Marshall Islands, Liberia, Croatia, Cyprus, Belize, Malta and Bahamas (2008).

⁸⁹ IMO Document LEG/Conf.15/21 and 22; text also under: www.imo.org/conventions/

⁹⁰ Ibid p. 181

These innovative boarding rules try to reconcile the flag state rights and the need to allow for expeditious control rights. Furthermore these agreements apply only to merchant ships, not to government transports. Thus, WMD transport by “rogue states” on board government vessels cannot be intercepted.

However, these procedures only apply as between states parties to SUA 2005. Moreover ratifying states have formally to declare their consent to the simplified boarding regime. As of 31 March 2011 some 20 states⁹¹ have acceded, representing 30 % of the world fleet. With the exception of Panama, Marshall Islands and St. Kitts many major maritime powers (US, Britain, Russia, Germany and France) and countries with large fleets (Japan, Greece, Norway) still abstain.

This lack of interest on behalf of major seafaring nations, naval powers and EU Member States is inexplicable given the wordy statements of politicians advocating the war on global terrorism.

With a view to the weaknesses of the piracy regime of UNCLOS it has been discussed that the SUA regime could offer a complementary role in that it covers *all acts of violence at sea* irrespective of maritime borders. The UN Security Council has taken up this idea in most of its anti-piracy resolutions⁹² and constantly reminds the states parties to the SUA 1988 Convention “*to fully implement their obligations ...for the successful prosecution of persons suspected of piracy and armed robbery at sea off the coast of Somalia*”⁹³. Thus, for the first time a clear statement was made in favour of the applicability of SUA 1988/2005 to criminal acts of piracy. Consequently, the broad concept of *maritime violence*, as used in both SUA versions, should be taken as a starting point for future legislation in all areas of security because this wording is a fitting generic term to cover all modern manifestations of violence ranging from terror, piracy, trafficking in arms and drugs down to “normal” criminal offences.

Summary

The organizers of this panel invited speakers to make proposals to resolve existing gaps and ambiguities in the law of the sea: My proposal is ratification and full implementation of SUA 2005 by the Western seafaring states, and – possibly - a subsequent refinement of rules within the legislative organs of the IMO, the competent international organisation for the safety (and security?) of navigation and environmental protection.

Apart from IMO, the UN Security Council will play a central role in the legal-political fight against maritime violence. The Security Council as a “world legislator” has expanded its role and may well produce more new rules of intervention⁹⁴. The combination of the two concepts in Chapter VII, namely that of self-defence – art. 51 - and that of defence of peace and security (and the protection of innocent civilians) may well serve as a basis for new legislation. The advantage of this kind of legislation is its universal character as compared to bilateral or regional agreements which are only binding upon the states that have ratified or acceded. The first priority clearly is a universal security framework at sea and not a patchwork regime. But, of course, there is always room for a combination of UN Security Resolutions and bilateral or regional initiatives such as boarding and inspection agreements⁹⁵, or regional anti-piracy activities.

⁹¹ Algeria, Austria, Bulgaria, Dom. Republic, Estonia, Fiji, Latvia, Liechtenstein, Marshall Islands, Netherlands, Panama, St. Kitts, St. Vincent, Serbia, Spain, Switzerland, Turkey, Vanuatu, representing together 30 % of world tonnage.

⁹² See above Fn. 36.

⁹³ UN General Assembly Res. “Oceans and the Law of the Sea”, A/65/37 of 17 March 2011, no. 98.

⁹⁴ Res. 1973 (2011) on Libya.

⁹⁵ Conrad Ruppel, Die Proliferation Security Initiative PSI – Eine Analyse und die Perspektiven. *MarineForum* Vol. 83 (2008) no. 12, p 6-7.

Concept of Maritime and Coastal Security post Mumbai Terror Attacks

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Background

It is not without reason that the present century has been called the Asian century that is also the century of the seas. The growing economic clout of Asian countries in general and that of India and China in particular have brought in new dimensions to the maritime equations in the region. The growing Chinese aspirations to step out of the first and second defence lines and beyond Malacca Straits in to the Indian Ocean is being watched keenly not only by its immediate neighbours but also other maritime powers of the world. While capabilities and intentions are being intensely debated, the military expansion and modernization (with a great emphasis on cutting edge technology) has challenged the existing maritime equations.

In the backdrop of all the maritime developments it is necessary to identify the factors that characterize the present century. Some of them indeed belong to the genre of unchanging fundamentals of the maritime century.

- Discernable Shift of CG to the Asia Pacific;
- Increased dependence on the oceans for leveraging Geo political /Geo Economic/Strategic interests;
- Economic development driven by EXIM(Export/Import) on sea routes, especially energy products, raw materials and goods for global markets;
- Maritime Terrorism and Piracy denting the concept of the freedom of the seas - '*Mare Liberum*,'
- Increased dependence on living and non-living resources from the oceans bringing about acute competition;
- Inevitable increase to transportation/insurance costs etc.,;
- Greater risks of environmental degradation and marine pollution with enhanced scope of activities at sea;
- Increased incidences of both manmade and natural disasters requiring HADR capacity at a global level;
- Legal and Enforcement agencies challenged in their role by reach and spread of VNSAs and asymmetric nature of threat in the global maritime commons; and
- Technology impact on stake holders.

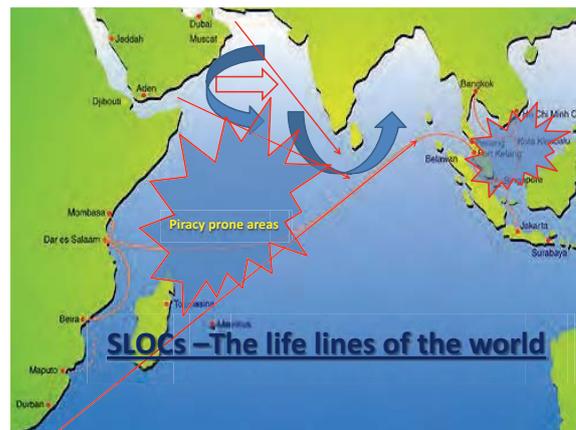
Geo-Strategic Interests

The geo-political, geo-economic and geo- strategic interests in the Indian Ocean Region are driven mostly by energy security and regional disparities/disputes. The energy starved economies have no choice but to scout for energy resources around the world and then use the seas to transport large quantities of energy products to sustain the healthy growth of economies. The extent of acute dependence is made amply clear with import of energy products for China being more than 80 percent. While China is not an Indian Ocean power, it has dominant interests in protecting its ships that transit through many choke points in the Indian Ocean. India

likewise is reaching similar dependency figures. While the volatility and fluctuation of oil prices does affect the economy, any disruption of the mercantile marine products; notably energy is something that is worrisome for all nations who depend on the seas for sustained uninterrupted flow of goods both ways. The diagram below illustrates the geo strategic situation in the Indian context where the interests of many seem to be on boil in a cauldron called Indian Ocean.



As a major importer and also a nation now increasingly becoming assertive in maritime matters, China would figure prominently in all discussions. The international maritime community is indeed concerned about the freedom of the high seas as sea farers have now to contend both with asymmetric threats, terrorism and piracy attacks in addition to geo-political environment of acute competition amongst nations whose waters are transited by law abiding ships .The piracy prone attacks are shown in the diagram below.



In the Indian scenario, it has a substantial area entrusted for providing Search and Rescue facilities by an international mandate in the four million square kilometers of area. By the Maritime Zones of India Act it is also required to look after more than two million square kilometers of sea area designated as the Exclusive Economic Zone (EEZ). The areas required to be kept under surveillance shown in the two maps below illustrate the range and reach required for accomplishing assigned roles.



The maritime security challenges in the Indian context are exemplified by the following factors:

- Long Coast line 7516 kilometres;
- Far flung Islands on both sides;
- Nine maritime states;
- 13 Major and 213 minor ports;
- Unresolved maritime borders with Pakistan and Bangladesh;
- Troubled waters in the South;
- Asymmetric threats;
- Extra Regional power presence;
- Expanding dimensions of Asymmetric warfare;
- (Unconventional attacks by improvised sub, sub surface, air and cyber units);
- Technology, Training and Tools availability to non-state actors; and
- Paradigm shift in the maritime security concept in India post Mumbai terror attacks.

According to US Office of Naval Intelligence website an advisory issued from the Department of Transportation last year indicated that “Information suggests that al-Qaeda remains interested in maritime attacks in the Bab al-Mandeb Strait, Red Sea and the Gulf of Aden along the coast of Yemen”. It has now been established that there was an attack against M Star a Japanese Tanker that was transiting through the Straits of Hormuz on 08 Jun 2010.



Such advisories and the increased acts of piracy in the Indian neighbourhood has instilled fear amongst seafarers, who if taken as hostages remain for months at the mercy of the Pirates who would not release them till the ransom moneys are paid. At most times, these are extended processes with unending negotiations that only add to the vows of the merchantmen.

Security Challenges

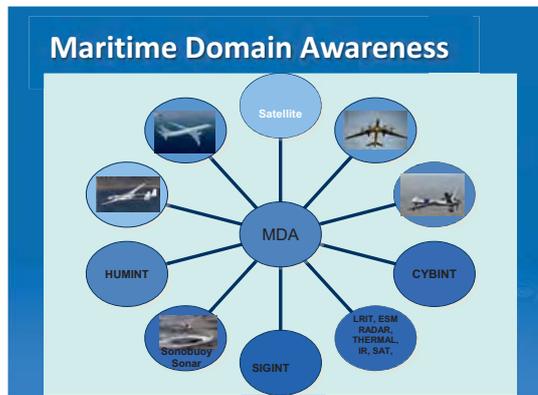
Traditional threats for which maritime forces are tasked are listed below and are common to the navies of the world.

- a) Safeguarding the sea frontiers, ports, off shore installations and EEZ protection including marine pollution;
- b) Anti-smuggling, anti-poaching, anti-piracy, preventing gun running and trafficking;
- c) Environmental protection;
- d) Safety of lives and property against VNSAs;
- e) SAR including CSAR; and
- f) HADR.

Maritime Domain Awareness

The term MDA is being increasingly used to include the entire processes that bring about total awareness of the maritime environment. It is being understood with greater clarity, that it is not just limited to military environment but is inclusive of all aspects of maritime incidents that need application of remedy. Therefore it could at one level be the awareness required to manage small craft including fisheries vessel on a 24x7 basis and at another level, it is the comprehensive awareness required to manage a maritime disaster whether man made or natural by pooling of all resources.

The recent example of the Tsunami and the consequent nuclear disaster in Japan clearly illustrates the need to be fully aware of the happenings in the maritime arena so that timely action is possible.



The diagram above illustrates the sources of input and the way it is fused in data fusion centres, to bring about total awareness in the areas of interest both at the local level and in contiguous areas of likely influence of an event. It is essential to bring out that most think of tracking bad guys--terrorists, criminals, WMD, slavers, etc., as the ends of Maritime Domain Awareness, but that is an incomplete understanding.

“MDA is "...the effective understanding of anything associated with the global maritime domain that could impact the security, safety, economy or environment of (any maritime nation)”. Having looked at MDA, it is necessary to examine the Surveillance goals which again which can be achieved only with efficient security architecture dependent on seamless surveillance. This should include/cater for:

- a) Comprehensive cost effective ISR architecture, well equipped role specific platforms, cutting edge technology, good training and well-rehearsed procedures;
- b) Getting the best out of the C4I2SR specific to area of Ops;
- c) Total MDA including the fourth dimension(Cyber dimension);
- d) Technology for detecting both capabilities and intentions(exhaustive data base, algorithms and intelligent tools);
- e) Proactive actionable intelligence; and
- f) Smooth interfaces with NCO/NCW capacity.

The Scene post Mumbai Terror Attacks

Just as 9/11 brought about a paradigm shift in the way counter terrorism efforts were considered, the Mumbai terror attacks brought about radical changes in the Indian context. In hindsight, one could say that it unfortunately took an incident of this magnitude to bring about greater awareness on the need to have a robust mechanism without loop holes. However, there is a need to remind ourselves that terrorists are indeed innovative and would be looking at new ways to beat the existing systems. Key changes in the maritime security architecture were introduced to enable national and state agencies to be better prepared for similar contingencies. Notwithstanding some uncomfortable questions on why such measures were not there in the first place, the notable changes include:

- a) Indian Navy at the apex of MSA and made in charge of the entire gamut of maritime security
- b) Four tier maritime security involving, Intelligence, Coastal Police, Coast Guard and the Indian Navy
- c) Revamping of MDA 'means and methods' by adding assets and incorporating new technological means
- d) Terror redefined- Legalities and jurisdictional issues-Creation of National Investigation Agency(NIA),Multi Agency Coordination(MAC) Centers etc.,
- e) Augmentation of naval, Coast Guard and marine police wing assets in a time bound manner.
- f) Creation of Sagar Prahari Bal for exclusive protection of vital assets along the coast.
- g) Creation of new CG RHQ in North West (Gujarat)
- h) Installation of Coastal Security Surveillance Radars
- i) More Table top and real time exercises by involving all stake holders.
- j) Revamping of the intelligence structures and better sharing of actionable intelligence.
- k) Control of maritime operations from Joint Operations Room by involving multiple agencies in the same room.
- l) Creation of new CG Stations for reinforcing coastal security.
- m) Launching of exclusive Satellite for maritime applications.
- n) Creation of National Security Guard(NSG) hubs in all metros and training of additional personnel
- o) Proposal for setting up of NCTC (National Counter Terrorism Centers). Apparently there are some road blocks for implementation which need to be cleared soon.
- p) Review of ISPS provisions for small vessels to overcome the threat of small unmonitored unregistered vessels.
- q) Expediting the setting up of the Coastal Security Group –marine police stations
- r) Setting up of coastal radar network with BEL Old light houses being used for installation of HDWS
- s) VATMS in many ports to add the air movements to the Vessel Traffic Management Systems
- t) Unique Identification Document(UID)- A national project conceived on the IT strengths of India for providing smart cards for all Indian nationals with most data on the card that would enable quicker tracking of personnel involved with crimes

Lessons

“India will continue to face a serious jihadist threat from Pakistan-based terrorist groups, and neither Indian nor U.S. policy is likely to reduce that threat in the near future”. [Rand Report] Mumbai terror attacks have many lessons for all of us particularly in the context of the assertion in a Rand report as indicated above. In fact, some of the lessons are universal in nature with wide range of applicability and need no further elaboration.

- a) National Investigation/Commission of Inquiry always necessary in such cases to get in to the depths of the problem;
- b) Availability of Maps/Walk through models of all VAs/VPs along with drills inescapable to be able respond in time;
- c) Need for greater interaction with Pvt Security at regular intervals to sort out glitches including communication and mutual interference;
- d) Joint Ops for C4ISR;
- e) Need for review of weapon inventory and trg methods keeping in mind that the terrorist use the latest weapons and are trained in commando type operations;
- f) Drills for coordination;
- g) Media regulation. It was clearly brought out that the live coverage by many channels in India was simultaneously monitored across the border by handlers and vital information provided about counter operations by the Special Forces; and
- h) Better interaction with other intelligence agencies and procedures for sharing info. This remains a weak point as there are indeed turf wars and a reluctance to share information.

Recommendations

Based on the lessons learnt and a few recommendations are in order:

- a. Develop the fishermen as 'eyes and ears' at sea. Process should include sensitization, briefings, literature and attractive rewards for information at sea. It is not a one off effort. It has to be continuous, sustained, meaningful and well integrated in the ISR schemes.
- b. Public Participation in coastal areas by toll free phones and use of electronic and print media highlighting lurking dangers.
- c. Harnessing Air effort from all resources for maritime coastal surveillance. This should also include civil aircraft and other private planes which need to be integrated in the information loop.
- d. Small Ship Security needs greater focus. The threat invariably is from smaller vessels which evade detection by merging with other coastal traffic or fishing vessels while waiting for opportune targets.
- e. Revitalizing the reporting from master of merchant vessels, OSV, Research vessels, commercial aircraft. This was an established practice during wars. However, there is a need to revitalize this procedure to compliment the surveillance and spotting efforts.
- f. Real time integration/collation and analysis of all inputs for better MDA
- g. Strengthening the hands of Coast Guard and Marine Police Wing simultaneously to augment ISR efforts.
- h. Review C4ISR issues in each geographic area to plug loop holes. This can be achieved by dedicated exercises with all security agencies to fine tune existing apparatus.
- i. Deploy UAVs; tethered balloons for enhanced Op picture. While the tethered balloons can quite easily be used in coastal stations, the UAVs today have an ability of being deployed by even smaller vessels. There is a need to optimize the sensor packages and streamline data input/exchange amongst operators.

- j. Review of Satellite info from both civil and military agencies—Designing specific sensors as payloads in our own Satellites based on local requirements. Strategic and Op integration of the Ocean sat being launched for exclusive use by the Indian Navy needs careful thought.
- k. Conduct both table top and actual exercises involving all agencies periodically and draw up Standard Operating Procedures(SOPs) to ensure that the same mistakes are not repeated again and again
- l. **Physical security. This has to be accorded the highest priority, as even if all else fails, the physical security should not fail.**

The lessons can be summed up by what has been suggested in the study post Mumbai terror attacks as Proactive, preventive, assertive actions.

.....Our preference is to stop an attack in the earliest planning stages. But, in an evolving threat environment, we must proceed on many levels simultaneously. The international threat of terrorism is not going away.

*Terrorists are thinking creatively about new tactics. **So must we.** And while we have to learn from Mumbai and prepare to defend ourselves against a similar attack, we cannot focus too narrowly on any one preventive method.*

*We need to **go back to basics**, strengthen our defense on every front, and stay sharp, well-trained, well-equipped, and constantly vigilant. And we must continue to work together at every level of government to defeat those would harm us”*

Cooperative Collaborative Opportunities

With the development of complex maritime challenges, there is a need for the maritime forces of the world to come together at a sub-regional/Regional and extra regional entities that are talking to each other and are prepared to jointly take on the threats to the freedom of the seas. As brought out in the diagram, below, it is clear that there are opportunities for increased collaborative efforts for conducting scientific and technical collaborations, for providing HADR, deep sea mining, other initiatives in the hunt for energy products, living resources and deep sea minerals. The diagram below is indicative of the nature of threats and areas for cooperation amongst maritime nations. There is a greater need today than ever before in harnessing the capacity of different maritime nations in times of contingencies. The Tsunami in December 2004 and in March this year, have clearly brought out the need for enhanced capacity building to be able to handle the scales of disaster.



Organizations / Initiatives

There have been many regional and international grouping. There is a need to include maritime security and the current challenges in the discussions and arrive at decisions that would shore up the regional maritime security architecture to compliment global initiatives to promote the concept of safe and secure seas. Some of the organizations are mentioned below without going in to details of their charter.

1. SAARC in 1985
2. ASEAN; ARF
3. BIMST-EC
4. CSCAP
5. BoB Bay of Bengal grouping
6. ReCAAP; PRC
7. Milan
8. Bilateral /multilateral exercises -questions there??
9. NGOs/track two' initiatives
10. CTF 151; MNF

Conclusions

- a. Maritime Environment has enormous complexities that need deft handling;
- b. The focus will continue to be in the Asia Pacific with the shift of the balance;
- c. Cooperative collaborative arrangements do provide effective response mechanisms to the emerging threats at sea;
- d. Regional maritime collaborative efforts need to be encouraged for the common good of humanity;
- e. With the scales of devastation due to both manmade and natural disasters, maritime forces would need to have regional contingencies in place;
- f. Plenty of scope for maritime nations to get their acts together to provide HADR and hone their skills in such humanitarian missions;
- g. Exchange of information and timely intelligence inescapable if one has to be ahead of the adversary;
- h. Terrorists would continue to innovate and so must we; and
- i. While the menace of piracy has to be definitely addressed the root causes in Somalia need international attention to apply long term remedies.

Land borders divides countries, oceans unite them!

Information Sharing in the NATO Maritime Environment

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United States of America



Abstract

In 2008, the Military Committee (MC) tasked Headquarters, Supreme Allied Commander Transformation (HQ SACT) to develop a Maritime Situational Awareness (MSA) Concept. Simply, MSA is awareness of the maritime operating environment at any given moment. This tasking included a Legal Study to examine legal and policy constraints on maritime information sharing. The study focused on information required for effective MSA, including how information is generated, controlled, used, and distributed.

In general, MSA effectiveness arises from four related components: (1) a timely and sufficient stream of information; (2) adequate technology to process the volume of information received; (3) a suitable number of trained analysts to assess the operational implications of the information; and (4) flexible arrangements for coordinating and sharing with stakeholders. The Legal Study focused on factors (1) and (4).

MSA also requires two sets of data for information superiority. The first is routine information needed every day to create an acceptable steady-state maritime picture, whereas the second is information needed during times of increased danger. When a threat or crisis looms, information is shared readily among nations. However, when operational tempo is slow and steady, the information flow subsides. During this time, an accurate picture must still be maintained.

The Legal Study Team (LST) sent out two Information Requests (IRs) asking nations if they are willing and able to share specific maritime information identified as necessary by the NATO maritime component commands. From the responses, the LST determined that information sharing issues fall into three categories: legal, policy and classification. This study is a first step towards identifying impediments that prevent NATO Nations from sharing information with NATO.

Introduction

The results of the Legal Study were intended to strengthen NATO's MSA capability by examining the sources and flow of information required for effective MSA, how this information is generated, controlled, distributed, and used, and the legal and institutional barriers that impede the flow of maritime information or hamper NATO MSA.

In simple terms, MSA is awareness of the maritime operating environment at any given moment. It is an essential part of MSA to create and monitor a comprehensive picture of maritime movements, both military and commercial, and to share this information within NATO. MSA strives to foster the improvement of an existing, but incomplete, information and sensor network. Early detection of suspicious behaviour of any merchant vessel anywhere enables better collective and/or individual responses. Successful MSA increases effective information and intelligence support to NATO operations and contributes to the efficient employment of naval units. It also contributes to an accurate NATO Recognised Maritime Picture (RMP), a geographic picture of processed information for activities in the maritime operating environment.

NATO MSA depends on several organisations to manage and process data. The two maritime components within NATO are Allied Maritime Command Northwood (MC HQ Northwood) and Allied Maritime Command Naples (MC HQ Naples). Within each MC HQ, the Maritime Operations Centre (MOC) is the hub of maritime information gathering activity. Each MOC is supported by a NATO Maritime Intelligence Coordination Centre, which carries out intelligence functions. The MC HQs coordinate MSA activities in their respective Surveillance Coordination Area (SCA), build and maintain the NATO RMP, and exploit and disseminate MSA information on behalf of the Alliance. The MOCs also establish relationships, facilitate continuous and mutual exchange of information, and coordinate surveillance activities with national MOCs. In addition, MC HQ

Northwood houses the NATO Shipping Centre (NSC). The NSC is the primary point of contact between NATO and merchant shipping representatives, national shipping authorities, and international maritime agencies. The NSC compiles a white, or commercial, shipping plot based on voluntary information provided by cooperating ships. Together, with accurate MSA, the MC HQs and the NSC have the potential to create a reliable NATO RMP.

Methodology

Rather than analysing lengthy national legislation and policies to identify potential barriers, the LST asked the 28 NATO Nations about their ability and willingness to share specific information. The LST began its study by focusing on nations' ability to share information about Vessels of Interest (VOIs) with NATO. A second IR focused on baseline information requirements developed in coordination with maritime analysts and operators. The requests for information sought a national response, usually requiring coordination among relevant government agencies and ministries. The information requests made it clear that "sharing with NATO" means that information would be available to all NATO Nations.

How does NATO Achieve MSA?

NATO has multiple tools at its disposal to achieve the current level of MSA. The main MSA tools are the Maritime Command and Control Information System (MCCIS), the Maritime Safety and Security Information System (MSSIS), and the Baseline for Rapid Iterative Transformational Experimentation (BRITE). Where reporting systems are not automatic, information is collected and transmitted on a voluntary basis via message traffic and other conventional means. Timeliness, accuracy and the availability of background information are essential to turning information into actionable intelligence.

MSA information requirements depend on whether NATO is conducting routine day-to-day operations or its maritime security is at risk. MSA does not require all maritime data to be stored in a single database, but rather that data be readily available. Nations should be encouraged to share information regularly and not just when there is a change in MSA posture. Essentially, the MSA postures lead to two sets of required data for information superiority. The first is information needed every day on a routine basis, whereas the second is information needed when a crisis or threat exists.

What Baseline MSA Information is Available to NATO on a Routine Basis?

NATO's maritime commands receive information from a wide range of sources. These sources can be divided into two basic categories -- nations and online databases -- and both types of sources provide valuable information to operators.

A number of commercial companies, such as IHS Fairplay and Lloyd's List Intelligence, offer subscriptions to online databases they maintain and update. These companies currently provide a wide variety of information under licensing agreements with users in the MC HQs. There are also hundreds of open sources from which NATO obtains information for MSA. These websites provide information on ports, straits and shipping companies, as well as on positional updates, vessel details and history, Maritime Mobile Service Identification and International Radio Call Sign. Despite an abundance of information from paid and free sources, this information does not provide a complete and accurate MSA picture. This is why it is crucial to have information from NATO Nations.

Vessels of Interest

One of the most important types of information nations can provide relates to vessels of interest (VOIs). (In the Legal Study Report (LSR), the term "VOI" refers to all suspicious ships, both national and NATO.) The ability to track and monitor vessels exhibiting anomalous or suspicious behaviour provides an awareness of potential security threats at sea. Although nations may differ from NATO in their definitions and criteria for VOIs, there is a common understanding of which vessels pose potential maritime threats and should therefore be singled out.

The Legal Study surveyed nations' ability to share information about VOIs with NATO. The Part One IR asked nations if they are willing to share the names of ships they determine to be VOIs at the time they are

determined to be VOIs. The IR also asked nations if they were willing to share specific information about a suspicious ship or VOI, such as why it is considered suspicious, its location and course, and other relevant information. Responses to this question are outlined in the table below.

	Name/information on ships when designated as VOI by nation
Yes	16
<i>Caveats</i>	9
<i>Unclear</i>	1
No	0
<i>Not Applicable</i> ⁹⁶	2
Total	28

Sixteen nations will share with NATO information on VOIs at the time of determination. Early sharing of national VOI information is a crucial step in allowing NATO to gather threat information and act accordingly. Nine nations indicate they can share under certain circumstances. Those nations listed the following caveats:

- Will share if the information sharing process is clear and transparent
- Will share as long as the information shared does not become the sole property of any one entity
- Will share pursuant to bi- or multi-lateral agreements
- Will share if no violation of international, European Union (EU) or national law on data protection
- Will not share if it compromises intelligence assets, criminal investigations or judicial proceedings
- Will share on a case-by-case basis
- Will share information on vessels posing a threat to national security; any other types of VOIs will be shared on a case-by-case basis
- Will share if reciprocity among nations is guaranteed
- Will share based on operational needs and mandates

Most of these caveats do not pose an insurmountable barrier to sending the name of a VOI to the MC HQs. The only factor limiting some nations from sharing information on suspicious vessels with NATO is internal policy. In this context, policy may not be codified in a traditional sense, but ultimately relates to trust and the notion of reciprocal information-sharing.

In conclusion, the most important element of this analysis is that most nations are willing to share information about VOIs with NATO at the time they are determined to be so. In most cases, nations will do so unequivocally. For some, sharing will be done on a case-by-case basis. In current practice, most NATO nations do not share their national VOI lists with NATO. When information is shared, it normally relates to a vessel on NATO VOI lists. MSA cannot move forward unless nations put into practice what they have indicated on paper.

National Maritime Surveillance Sensors

Maritime surveillance sensors are a critical component of information superiority. The wide range of technologies currently in use equips nations with the tools to collect information and, in many cases, to disseminate it to domestic and international partners.

The Legal Study asked nations if they would share information about their land-based sensors, such as Automatic Identification System (AIS), Long Range Information Tracking (LRIT), Radar, Electro-Optical and Acoustical, as well as their space-based sensors. The responses indicate nations will generally share positional information about national maritime surveillance sensors with NATO.

⁹⁶ Not Applicable applies when a nation does not have relevant information due to geographic or capability limitations.

AIS

	Positional information on AIS sensors
Yes	11
Caveats	7
No	1
Not Applicable	3
No Answer	6
Total	28

Eleven nations are willing to share the position of their AIS sensors. Only one is not, citing classification and EU legislation. No other nation cited EU legislation as a barrier to information sharing. Seven nations have caveats to the release of such information, such as:

- Can only release unclassified information about sensors
- Can release on a case-by-case basis based on a variety of factors, such as the use of information in legal proceedings and protection of intelligence sources
- Can only share the general location of the sensors as exact location is classified
- May share on a case by case basis
- Can only share information about AIS sensors operated by the Navy; for AIS sensors operated by other national entities, the Navy needs an agreement with that entity in order to release to NATO
- Can only share sensors under the purview of the MOD/Navy; the national entity that owns other sensors cannot share due to data protection laws

Aside from one nation's interpretation of EU legislation, no legal barriers prevent sharing AIS positional information.

LRIT

	Positional information of LRIT sensors
Yes	5
Caveats	5
No	0
Not Applicable	12
No Answer	6
Total	28

The question was not applicable to twelve because they do not have national LRIT sensors, or they use sensors operated by EMSA. Five nations listed policy caveats:

- Can only release unclassified information about sensors.
- Release on a case-by-case basis based on a variety of factors, such as the use of information in legal proceedings and protection of intelligence sources
- Can only share the general location of the sensors as exact location is classified
- Can release LRIT data operated by non-naval national LRIT authority if the Navy has an agreement with that entity that allows release to NATO
- Cannot share as the Navy does not have the information; must ask the national entity that has the information

There are no specific legal barriers to sharing this information.

Radar

	Positional information of land-based radar sensors
<i>Yes</i>	9
<i>Caveats</i>	6
<i>No</i>	4
<i>Not Applicable</i>	3
<i>No Answer</i>	6
Total	28

In the “no” responses, two nations will not share radar locations solely due to classification; the third nation cites classification and EU legislation, as it did for AIS sensors. The fourth cited policy. Six nations listed caveats, such as:

- Can only release unclassified information about sensors
- Can release on a case-by-case basis based on a variety of factors, such as the use of information in legal proceedings and protection of intelligence sources
- May share on a case-by-case basis as the Navy does not own the sensors
- Can only share information about radar operated by the Navy; for radar operated by other national entities, the Navy needs an agreement with that entity in order to release to NATO
- Can share data about sensors operated by the Navy; must ask other national entities for data from sensors they operate

There are no specific legal barriers to sharing this information.

Electro-optical/Acoustic

	Positional information of electro-optical and acoustic sensors
<i>Yes</i>	6
<i>Caveats</i>	5
<i>No</i>	6
<i>Not Applicable</i>	5
<i>No Answer</i>	6
Total	28

Three of the “no” responses are due to classification; three are due to policy. One of the six also said “not sure NATO needs to have this data.” The caveats are:

- Can only release unclassified information about sensors
- Can release on a case by case basis based on a variety of factors, such as the use of information in legal proceedings and protection of intelligence sources
- May share on a case by case basis as the Navy does not own radar
- Can only share information about sensors operated by other national entities if the Navy has an agreement with that entity to release to NATO

There are no specific legal barriers to sharing this information.

Space-based

	Type and orbital information of space-based sensors
Yes	4
Caveats	1
No	3
Not Applicable	14
No Answer	6
Total	28

Of the “no” answers, one nation continued to cite classification and EU legislation; one cited policy; and the other, for the second time, said they are not sure NATO needs this information. The one caveated response is the same response used by one nation throughout the entire Part Two IR: release will be judged on a case-by-case basis based on a variety of factors, such as the use of information in legal proceedings and protection of intelligence sources. Most nations state they do not possess this capability.

Among NATO nations, policy (which includes security classification) is the main limitation on sharing specific information about maritime surveillance sensors. Although a legal barrier was routinely asserted by one nation, no specifics were given about the EU legislation in question, and no other NATO/EU nation cited this factor.

Non-VOIs Routinely Detected by Maritime Surveillance Sensors

In addition to sharing information about VOIs, MSA sometimes requires information about routinely detected vessels, or vessels that are not considered VOIs. NATO needs to be able to access this information quickly, particularly when a vessel is exhibiting suspicious or anomalous behaviour.

Ship Identity (name and registry details) and Location(position, course, speed and time)

	Ship identity and location
Yes	12
Caveats	6
No	1
Unclear	1
Not Applicable	3
No Answer	5
Total	28

One nation said no because of its strict interpretation of Article 24 of Directive 2002/59/EC of the European Parliament and of the Council establishing a Community vessel traffic monitoring and information system (27 June 2002). No other EU country member of NATO noted that Directive as a barrier to sharing such information. The six caveats are:

- Can share if there is a bi- or multi-lateral agreement
- Can only share if it does not violate national data protection law
- Can share data the Navy possesses (purely Navy response)
- Can release on a case by case basis based on a variety of factors, such as the use of information in legal proceedings and protection of intelligence sources
- Can share information that comes from the Navy; for information from other national entities, the Navy needs an agreement with that entity in order to release to NATO
- Can share Navy data only

Reporting Command, Source Quality Indication (time-stamp accuracy, position accuracy and level of confidence in the source), and Technical Data

	Reporting command, source quality indication and technical data
<i>Yes</i>	7
<i>Caveats</i>	8
<i>No</i>	2
<i>Unclear</i>	2
<i>Not Applicable</i>	4
<i>No Answer</i>	5
Total	28

Negative responses are due to policy and classification limitations and not legal restrictions. The caveats are:

- Can share if there is a bi- or multi-lateral agreement
- Can only share if it does not violate national data protection law
- Can share data the Navy possesses (purely Navy response)
- Can release on a case-by-case basis based on a variety of factors, such as the use of information in legal proceedings and protection of intelligence sources
- Can only report data that is not classified
- Can share information that comes from the Navy; for information from other national entities, the Navy needs an agreement with that entity in order to release to NATO

Reference Information (ownership structure, imagery, and cargo information)

	Ownership structure	Imagery of the ship	Cargo information
<i>Yes</i>	6	7	8
<i>Caveats</i>	10	10	10
<i>No</i>	2	1	1
<i>Unclear</i>	1	1	1
<i>Not applicable</i>	4	4	3
<i>No answer</i>	5	5	5
Total	28	28	28

Answers for all the information in this category are very similar. One nation that answered “no” cited legal restrictions in EU legislation protecting sensitive data related to mercantile commerce. The caveats are in these general categories:

- Can share if there is a bi- or multi-lateral agreement.
- Cannot share information from commercial sources due to contractual obligations.
- Can only share if it does not violate national data protection law.
- Can share data the Navy holds (purely Navy response).

The only legal barrier identified here is data protection law. One nation cites its national law as a potential barrier. Another cites EU data protection law as an absolute barrier. That law may prohibit sharing certain information about routinely detected vessels. Absent the need to know certain information, as is the case for VOIs, none of the exceptions to the data protection law may apply. Only one EU nation specifically cited this law, although it applies to all EU nations. This could indicate that nation’s prevailing attitude toward sharing information or a stricter interpretation of the law compared to other EU nations.

Ships involved in maritime events

Although many vessels involved in “maritime events” would appear on VOI lists and thus be subject to monitoring by NATO, not all would. The activities of, and information about, those vessels may be of interest to NATO. The Legal Study asked if nations are willing to share the following seven types of information about ships involved in maritime events:

- Any incidents, violations, detainments and inspections
- Suspected illegal activities
- Company owner and operator of the ship involved
- Master of the ship involved
- Names and nationalities of crew members involved
- Cargo involved: origin, destination, and owner
- Additional information about the vessel (i.e. by inspection or boarding)

Nations were asked to answer the question for each type of information in the category. Most nations provided the same responses for all types, but some cited particular caveats. For example, one nation invoked personal data protection laws as a potential basis for not sharing crew information, but listed criminal prosecution considerations as the basis for not sharing information about illegal activities. This table summarises the responses for seven types of information in this category.

	Information on ships involved in maritime events
<i>Yes</i>	<i>6</i>
<i>Caveats</i>	<i>12</i>
<i>No</i>	<i>1</i>
<i>Unclear</i>	<i>1</i>
<i>Not Applicable</i>	<i>3</i>
<i>No answer</i>	<i>5</i>
Total	28

Caveats to information-sharing are of the same nature as the caveats discussed in the sections above. The caveats can be broken down into classification, policy and legal issues. Only one nation cited potential classification issues. Policy issues are the most frequent reason cited as a caveat to sharing information, for example:

- Can share if there is a bi- or multi-lateral agreement
- Will share on a case-by-case basis
- Can share information that comes from the Navy; for information from other national entities, the Navy needs an agreement with that entity in order to release to NATO

Caveats involving potential legal issues are listed below:

- Can only share if it does not violate national or EU data protection law
- Can only share if the data is not involved in an ongoing judicial proceeding
- Cannot share criminal data outside the context of NATO operations

In most cases, sharing information in this category would not be prohibited by EU or national law on personal data protection. Directive 95/46/EC of the European Parliament and of the Council on the protection of individuals with regard to the processing of personal data and of the free movement of such data (24 October 1995) contains, as do most data protection laws, provisions that exempt the provisions of the law in cases concerning public security, defence, state security, and criminal inquiries. Presumably, NATO would only need such information for security or defence purposes. Regarding the other two potential legal issues, if a vessel is already involved in a judicial proceeding or criminal case, then situational awareness by authorities has likely been achieved. Thus, these two issues do not pose a legal restriction to MSA.

National maritime assets

The notion of MSA contemplates that contingency planning may at times be required by NATO and NATO nations in response to a maritime threat. A maritime response can be more efficient if NATO and NATO nations know the whereabouts of national maritime assets. The Legal Study asked if nations would share the deployment schedules and routine patrol areas of national assets that might contribute to MSA.

	Deployment Schedules	Routine Patrol Areas
<i>Yes</i>	9	10
<i>Caveats</i>	6	5
<i>No</i>	4	4
<i>Not Applicable</i>	4	4
<i>No answer</i>	5	5
Total	28	28

The national responses indicate that 15 NATO nations will share this information with NATO, although approximately six of those 15 will only do so on a case-by-case basis. The four “no” responses were due to policy and classification. If the assumption is that NATO will only require this information for MSA when there is a threat, VOI, or suspicious activity, then nations will likely cooperate in these cases. Having MSA of national assets near the threat, VOI or suspicious activity will provide additional information to assess the threat or activity and enable contingency planning for any subsequent operations or responses. All NATO nations would benefit from this.

National maritime areas of focus

The Legal Study asked nations whether they would share information about national maritime areas of focus, such as:

- Fishing areas, including seasonal opening and closings
- Exclusion zones
- Anchorage areas
- Replenishment areas
- Oilrigs
- Ship routes and Vessel Traffic Surveillance (VTS)

NATO is aware of the maritime areas that nations monitor, then that nation is a potential source of information when NATO needs MSA in that area. Nations overwhelmingly agreed they could share this information with NATO. One nation will not share information about its fishing areas due to policy. Another will not share ship routes and VTS due to policy. No legal restrictions are identified.

National maritime ports

The Legal Study asked if nations would share the following information about their ports:

- Port characteristics
- Port facilities
- List of vessels in port and at anchor
- List of vessels scheduled
- Cargo information
- Historical data gathered by port authorities

The majority of NATO nations can share information about their maritime ports. Some nations placed caveats on sharing:

- Will share on a case-by-case basis
- Can only share Navy information; the information in question comes from government entities outside the Navy
- Can share information if compliant with data protection laws

A few nations said they could not share the information because of:

- Contractual obligations (confidentiality clauses) between maritime authorities and commercial port authorities restrict sharing
- EU legislation that prevents the release of sensitive commercial data related to mercantile commerce
- Classification issues

This information is important as it allows the maritime commands to determine patterns and to match maritime activity with port capability. For example, it would be suspicious if a vessel claimed it is carrying a particular cargo to a port that does not have the facilities to handle it.

Shipping companies

The Part Two IR asked if nations would share the following information on shipping companies:

- Contact information for beneficial owner, commercial operator and registered owner, including information regarding those responsible for compliance with International Maritime Organisation (IMO) and SOLAS regulations and conventions
- Information regarding incidents and violations, including those placed on Black/Grey lists

The responses provided for both types of information in this category are nearly identical.

	Information about shipping companies
<i>Yes</i>	<i>8</i>
<i>Caveats</i>	<i>10</i>
<i>No</i>	<i>1</i>
<i>Not Applicable</i>	<i>3</i>
<i>No answer</i>	<i>6</i>
Total	28

Eight nations will share this information. One nation will not share due to policy. Ten nations had caveats to the first type of information; nine had caveats to the second type of information. Five caveats were related to the availability of the information from other sources. For example, nations noted that the information could be obtained from EU databases, public records, and public web sites. Getting information from these sources anticipates a “pull” rather than a “push” system. NATO has to go out and grab the information from these sources, and nations do not have to do any direct sharing. The other five caveats to sharing are either case-by-case dependent or dependent on availability/ownership of the information within the government. No legal restrictions are noted.

What Baseline MSA Information is NATO Missing and Why?

At present, the MC HQs receive a significant amount of information and are able to process the data and spot anomalies accordingly. Even so, there is information that NATO does not regularly obtain, thus creating a capability shortfall. One example is information about VOIs. Not all nations are equally proactive in sharing this data with NATO. In most cases, nations do not send their national VOI lists to NATO.

Crew and cargo lists are further examples of information that NATO does not regularly have access to. This information can enable NATO to detect anomalies that are not apparent from reviewing basic ship data (i.e. name, course, speed, etc.) For example, crew and cargo lists can help determine why the crew of a particular ship changes frequently in a particular port, or why certain cargo is being shipped to a port that does not have facilities to handle the cargo.

While all NATO nations have the capacity to share some maritime information with NATO, NATO is missing certain maritime information that could increase its MSA. Analysis of the national responses suggests two

patterns. The first pattern is that certain nations are more prone to cite constraints than others. The second pattern is that certain information requirements consistently trigger the most constraints.

As a whole, the cited barriers for data-sharing involve either legal, policy or classification issues. In a few cases, nations could not share because they do not possess the capability to share, or they do not collect the information requested.

Legal Issues

Responses to the information requests revealed that three categories of legal issues limit or prevent sharing of MSA information with NATO. The first category involves limitations imposed by privacy and data protection laws. The second involves legal obligations from contractual provisions, such as commercial confidentiality. The third involves limitations due to pending civil or criminal investigations or litigation. Although legal issues raised by nations can limit or prevent the free flow of information to NATO, rarely are those obstacles insurmountable. NATO and NATO nations can work together to find solutions to overcome legal obstacles.

Privacy/data protection laws

Eight nations specifically cite a combination of national and EU data protection laws as potential barriers to information sharing. In general, privacy and data protection laws seek to balance the right to privacy with the public need-to-know for safety and security. Maritime situational awareness relies on the international flow of information. While cross-border transfers of information raise legitimate concerns about the handling and use of personal data, laws that allow such disclosures are not well understood and are often perceived as standing in the way of public safety and national security. Careful review of these laws and conscientious application of the provisions that allow disclosure will ensure that the rights of private persons and organisations, as well as the needs of nations and NATO, are met.

Contracts

The information requirements affected by contractual obligations are rather limited. Seven nations specifically state that contractual obligations and/or licensing agreements between their nation and commercial entities, (i.e. shipping companies, port authorities and maritime information services) prevent them from sharing information. Those provisions relate to commercial secrecy and confidentiality and are designed to protect sensitive information for economic purposes. Since a contract is a legal instrument negotiated between parties, it is possible that certain information could be shared with NATO if NATO offers the same level of protection as the nation. NATO could also potentially negotiate its own agreements. It has already done this in order to gain access to certain commercial maritime information services.

Crimes

The third category of legal limitations involves the exchange of personal data that may impact pending criminal litigation or police investigations. Five nations specifically mention this restriction. This restriction on information sharing is designed to prevent the compromise of police investigations or the tainting of judicial proceedings. But exceptions allow data to be shared for the prevention, detection or investigation, or prosecution of criminal offences; when the receiving body is responsible for the prevention, detection or investigation, or prosecution of criminal offences; when the member state from which the data is obtained consents; and when the receiving party ensures an adequate level of protection for the data.

Policy Issues

Nations cite policy as a reason not to share information in almost every information requirement. For purposes of this study, policy is the general principles by which a government guides the management of its affairs. It is self-imposed regulation or decision-making not forced by law or legal obligations. Although classification may be considered a policy issue, the study handles it as a separate category.

An examination of all national responses reveals that each policy reason listed is related to trust. More nations cited policy as a limiter to information sharing than any other reason. The following comments illustrate common sentiments expressed throughout the national responses:

- "...will share information when the principles of reciprocity and transparency are ensured..."
- We emphasise "the importance of trust and confidence between actors when sharing information which should be defined by bi or multi-lateral agreements based on a need to know."

- “[W]e are not sure of the need for NATO to have this information.”
- “The main issues are about trust (with whom you are going to share and for what)...”
- “...depending on the...political willingness...to deliver this information...”
- Information will be exchanged “with a specific country...recognised by our nation as a trustful partner...”
- “No information can be given unless the sharing process is clarified and a transparent one”
- “The information given will depend on...the condition of reciprocity.”
- “Due to the sensitive aspect of [this information], I cannot provide you with any further details.”
- “For reasons of national defence and security...data cannot be disseminated.”
- Because of “secrecy reasons, answers [to the Information Request] can amount to nothing more than yes or no.”

Many nations declare that a determination to share will be made on a case-by-case basis. When this case-by-case basis does not involve legal or classification issues, the main constraint seems to be an unspecified reference to national “policy.”

A third of responding nations stated they would share the information with NATO if an agreement exists or pursuant to bi- or multi-lateral agreements. Formal agreements already exist between NATO and NATO nations to govern information exchange and protection of information. Despite this cluster of general agreements, some nations continue to insist on specific agreements. During the past decade, there has been an accelerating emphasis within NATO from “need to know” to “need to share.” This new mind-set needs to take root in MSA if NATO is to keep pace.

Classification Issues

Classification issues affect the responses of seven nations. It appears mainly as a restriction to sharing information about national capabilities, national maritime assets, historical port data, and information about ships involved in maritime events. It was also cited most often by four specific nations, with more than half of the objections coming from the same two countries. In view of NATO safeguards already in place, classification concerns should not limit or prevent nations from sharing information needed for MSA.

The “NATO Agreement on Security of Information” provides that nations will protect and safeguard classified information that is submitted to NATO by a member state. Ratifying nations have also agreed not to use classified information for purposes other than those laid down in the North Atlantic Treaty or to disclose such information to non-NATO parties without the consent of the originator. Nations have also agreed to basic principles and minimum standards of security in order to ensure that a common degree of protection is given to classified information exchanged among them.

Although the amount of information affected by classification is the least of all three categories, the type of information is relatively important for MSA. Existing NATO security agreements should be sufficient to provide adequate protection and safeguards to allow nations to share this information with the maritime commands.

How can NATO Capitalise on Existing Information Sources to Enhance its MSA?

A number of existing information sources have valuable systems, procedures, and information that could benefit the Alliance. Regional data-sharing arrangements, law enforcement mechanisms, EU initiatives and systems, and shipping companies are sources of information that is relevant to NATO MSA.

Regional data-sharing arrangements

Regional data sharing arrangements are valuable as models of best practice for how to share information between information hubs. From a legal perspective, most cooperative arrangements regulated by an agreement or MOU contain a clause that prohibits sharing information with third parties without the consent of either the originator of the data or the entire group. Since NATO is not a country, it may be difficult to join these arrangements as a formal participant in order to obtain the information. Should NATO decide that access to information from those arrangements would be valuable, it may be possible to engage in pilot projects or reciprocal data-sharing for specific purposes.

If NATO wants to capitalise on information from these regional data-sharing arrangements, it must be proactive and open to creative solutions. Technology is a critical component of MSA, but the importance of human networking must not be underestimated. To that end, one recommendation is for future MSA roadmaps to allocate resources that would allow groups of operators and analysts from the MC HQs to visit these centres. Allowing operators to do on-site visits for first-hand observation and discussions would increase the mutual understanding of those involved in maritime information sharing. Once achieved, that understanding will allow stakeholders to determine how they can best work with each other.

Law Enforcement Mechanisms

By its very nature, MSA involves substantial cross-sector coordination among authorities dealing with the maritime domain. One of the most complex aspects of cross-sector cooperation is the balance between, and separation of, law enforcement and military responsibilities. All nations indicated that law enforcement authorities could share information with the military but 12 had caveats. The caveats indicate that sharing may be done on a case-by-case basis depending on the following factors:

- If sharing does not interfere with a criminal investigation
- If the information is not classified, protected or sensitive
- If the information concerns safety or security

Law enforcement agencies within a nation are potential sources of MSA information. International law enforcement organisations could be an even better source of information since they typically present a combined picture – i.e. they fuse information from a variety of sources and nations and present a more complete picture. If NATO could have access to information from these organisations, this would certainly enhance MSA.

European Union

Over time, the EU has developed practical solutions to regional coordination in the maritime environment. Through the establishment of comprehensive databases, pilot projects, and cooperative initiatives, the EU and its agencies are spearheading maritime cooperation in Europe. Considering that the majority of NATO nations are also EU Member States, perhaps the relevant national authorities in those states could be a conduit for exchange.

Shipping Companies

Discussions with shipping company owners and representatives indicate that companies will readily share information when a threat occurs, although this is best achieved if companies provide information on a voluntary basis. NATO's Planning Board on Shipping (PBOS) could be a useful conduit for NATO to approach shipping companies about information sharing for MSA since each nation is represented at the Planning Board by individuals with contact information on shipping companies operating in their country.

Conclusions

a. NATO nations are generally willing and able to share maritime information with NATO.

In their national responses, most NATO Nations state they are willing and able to share most of the information NATO needs for MSA. Many nations already share certain data on a regular basis, and most express a willingness to share in the future. In fact, every NATO Nation has indicated it will share information with the MC HQs on a case-by-case basis. Although most nations do not volunteer or "push" MSA information to the MC HQs, when the MC HQs ask for information, the nations are responsive.

When nations indicate they are not willing or able to share information, it is generally expressed as reluctance, rather than as an unequivocal "no." If nations truly want to share information, they generally find a way to do so. In point of fact, when an identified threat exists, nations do cooperate. The next step is to share information when there is no threat. Nations need to routinely share all the MSA information they have said they will share, without being prodded.

b. MSA is not yet a priority for all NATO nations or NATO.

Many NATO documents on MSA have passed silence and been distributed within NATO and to NATO Nations during the past three years. Yet, during the course of this 18-month study, discussions with both NATO personnel and national representatives indicate a lack of awareness of MSA and even more so, a lack of appetite for the work needed to make enhanced MSA a reality. This is important to note because the

validity of the Legal Study depends on conscientious and accurate responses from nations. Just as “9-11” led to an overhaul of security practices around the world, experience has shown that catastrophes evoke action. The Alliance should not wait for a maritime “9-11” event to serve as a catalyst for increased MSA, especially when there are so many opportunities for improvement now.

c. Legal issues do not present a significant barrier to information sharing.

NATO Nations have not presented compelling evidence of legal obstacles. Some nations cite “legal” issues as a reason not to share, when in fact the reason is not a legal issue at all. Upon examination, many legal issues are actually discretionary policy issues. The need to safeguard personal and classified data, honour contractual legal obligations, and protect information involved in ongoing criminal proceedings are all valid national concerns – but they are not insurmountable.

d. Policy considerations do present a significant barrier to information sharing.

Policy considerations are often represented as legal issues. Legal issues stem from actual laws and implementing regulations, creating legal obligations that can be adjudicated. Policy choices usually do not. Policy represents the underlying culture, ethos, values, and management preferences of an organisation. Over time, policies often have a tendency to erect protective barriers that serve the interests of sub-groups rather than the common good. In particular, national policies intended to compartmentalise or control information can easily hinder the flow of useful information to NATO and to other NATO Nations. Unless such policies are reviewed periodically for relevance, their cumulative effect can effectively strangle the flow of information, even though no overt decision was made to do so.

e. NATO can benefit from existing information-sharing partnerships.

Many effective, maritime information-sharing partnerships already exist. NATO has a long and successful history of creating partnerships and reaching out laterally to other nations on issues of mutual security interest. The Partnership for Peace, Mediterranean Dialogue, Istanbul Cooperation Initiative and the Euro-Atlantic Partnership Council are examples. Many of the nations in these communities also belong to regional regimes for sharing maritime information. These regional regimes could benefit NATO. The practices and processes of such partnerships can also provide useful models for NATO. Information systems and participation protocols are the core of successful information-sharing regimes.

f. Maritime sharing protocols must be clear.

NATO and NATO Nations need definitive guidance for maritime policy and how to accomplish MSA. In particular, the processes to share information must be clear and transparent, such as the method to share VOIs at the time of determination. Reciprocity is also an important condition of information sharing. Nations have indicated they want visibility about who is sharing what and how often. Classification and data-protection policies must also be consistent with information-sharing practices and concerns. Improved information sharing rests on the cornerstone of solid guidance.

g. Infrastructure and technology must support MSA.

In a multinational environment, technology is essential to share information in a timely manner across international borders. Currently, NATO technology and information systems lack some of the tools necessary to coordinate MSA properly. NATO Nations must also have adequate infrastructure to support interaction with NATO operational centres. Coordinated communication between national authorities and NATO is lacking in some cases. NATO Nations and NATO commands must be able to interact readily with each other to share maritime information. The timely and efficient transfer of information possesses value – delayed interaction does not. MC HQs often do not have the luxury of time to contact different organisations within a country to complete a maritime profile. MSA ideally requires one POC in each country to coordinate the gathering of relevant information within its own agencies before distributing it to NATO. By closing technological gaps and creating national liaisons, NATO can strengthen the interoperability needed for MSA.

h. Nations must adopt a “green light” approach to information sharing.

The current paradigm for information sharing will not achieve effective MSA for all MSA postures. The LST looked for patterns in the hundreds of responses to the questions in the information requests. Every answer can be categorised as a “red light,” “yellow light” or “green light” response. Generally, all the questions asked if a nation could share a specific type of information with NATO. “No” answers indicate a “red light” approach to information sharing. These nations stop themselves from sharing or do not even consider the feasibility of sharing certain information. Nations that list caveats adopt a “yellow light” approach. They are cautious about information sharing and guard information carefully. Nations that answered yes have a “green light” approach. These advocates for information sharing embrace the benefit of moving forward with MSA and find

constructive solutions to overcome problems. Many studies and reports on maritime information sharing have been published in recent years. They all agree that the culture of information sharing needs to change from a “need-to-know” to a “need-to-share” atmosphere. It is no different within the Alliance. Nations must be willing to find a way to share and when there is a barrier, they must actively seek to accommodate competing interests.

Recommendations

Today’s security environment is fraught with transnational threats and challenges. NATO’s strength lies in developing shared responses to shared threats. MSA is an area where coordination and cooperation are likely to pay dividends – both in terms of increasing overall effectiveness and also reducing the cost to individual nations. The LST recommends the following incremental steps:

a. Create a strategic communication plan to promote awareness and understanding of MSA.

In order for MSA to become a priority, nations must understand MSA and what it does for them. National practitioners, industry representatives, and policy-makers need to understand that MSA is a steady-state capability geared to constant maritime security outside the context of an operation – and also to understand that such a steady-state system has special requirements with regard to the flow of information and external relationships. If nations do not understand why NATO needs certain information on a steady basis and what safeguards are in place to protect the use of this information, they will be reluctant to share it. A strategic communication plan is intended to build awareness, understanding, and support for the decisions and activities of an organisation. This is paramount if the Alliance desires to create a culture in which MSA information is shared with minimal barriers.

b. Establish MSA points of contact in NATO Nations.

NATO Nations should establish one MSA point of contact (POC) to act as a concierge to facilitate the flow of MSA information between NATO and the nation. Some nations have greater involvement in maritime matters than others, but for major maritime nations these POCs should ideally be long-term positions dedicated to the task of responding to requests for MSA information. Resources permitting, nations are encouraged to establish or formalise a national liaison in the Maritime Operations Centres at the MC HQs. MSA depends on obtaining the right information at the right time, something that is difficult to accomplish when lines of communication are unclear. It is essential that the MOCs know whom to contact in each nation when they need information. The national MSA point of contact must have the authority to liaise with all civilian and military authorities with maritime responsibilities in the nation. Establishing this network of POCs should be a goal for the MSA end-state and will require high-level support.

c. Train and exercise MSA.

NATO should include MSA scenarios and problems in its exercise and training program. Exercises should involve information sharing between the MC HQs and national MSA POCs. This would present an opportunity to practice Alliance operational practices for information sharing and confirm national responses to the two Information Requests. NATO should also encourage visits by national MSA POCs to NATO maritime HQs at Northwood and Naples for briefings to gain a better understanding of the work and particular challenges facing NATO’s MSA teams. Reciprocally, personnel from the two NATO MOCs should visit national maritime centres for similar orientation and training and to share lessons learned from NATO’s involvement in MSA. The professional relationships established by such reciprocal visits will invigorate the network of personal contacts that facilitates the exchange of MSA information.

d. Seek commitments to share information about national Vessels of Interest.

NATO should request that nations share the names of vessels on their national VOI lists. Once a nation designates a vessel as a VOI, that information should be passed to the appropriate NATO maritime command, just as NATO passes its own list of VOIs to national maritime centres. A nation should also volunteer real-time information about vessels on the NATO VOI list.

e. Develop, maintain, and advance technology.

Technology must continue to support MSA. HQ SACT and NATO need to sustain and maintain technological tools as a linchpin of future MSA capability.

f. Approve an INTERPOL pilot project and consider other relationships with law enforcement agencies.

NATO should pursue a pilot project with INTERPOL. Collaboration with INTERPOL would benefit the Alliance since law enforcement information can be useful when sifting for maritime anomalies, yet NATO has no established conduit to obtain MSA-related information from national law enforcement sources. It has to be recognised, however, that sharing information between law enforcement and military organisations is potentially difficult. A pilot program with INTERPOL would be a good test case to determine whether NATO can meet the conditions set by INTERPOL and still obtain useful information. If this pilot project is successful, it could serve as a model for cooperation with other law enforcement organisations.

g. Establish relationships with existing maritime information-sharing organisations.

NATO should capitalise on its existing relationships and explore options for collaboration. Participation in regional organisations could help close the gaps in national information and also serve as an outlet for NATO to contribute to the greater MSA community.

h. Coordinate with the EU.

The EU plays an important role in maritime safety and security in the Euro-Atlantic region. Through its various agencies and bodies, the EU is making significant progress in maritime surveillance and information sharing. Operators and analysts at NATO's MC HQs would benefit from access to EU information and data.

i. Update existing policies and procedures that affect MSA.

MSA policies and procedures must be synchronised. We recommend that NATO undertake the following:

- Update and approve a final MC 367.
- Update and coordinate MOC standard operating procedures.
- Create a maritime information-sharing matrix to clarify procedures for nations.
- Eventually develop a STANAG capturing key MSA processes and procedures.

References

Maritime Situational Awareness Phase I Legal Study Report, 01 September 2010, North Atlantic Treaty Organisation, Headquarters, Supreme Allied Commander Transformation

**We hope to see you in the next
Combined Maritime Security Conference 2012!**

