



MARITIME SITUATIONAL AWARENESS



**FROM FRAGMENTED SEA SURVEILLANCE TO
COORDINATED MARITIME SITUATIONAL
AWARENESS**



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IN COLLABORATION WITH

MULTINATIONAL MARITIME SECURITY CENTRE OF EXCELLENCE

AND

BEYOND THE BORDER CONSULTING LTD.

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NATO MARITIME INTERDICTION OPERATIONAL TRAINING CENTRE

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1. Abstract

In an increasingly interdependent, interconnected, rapidly evolving and globalized world, a “maritime 9/11” type event could have a devastating impact on global security and economic prosperity and shake public confidence in the global order to its core.¹ The security of the maritime commons is not a given. Without a comprehensive shared understanding of what is occurring in the maritime domain, achieved through Maritime Domain Awareness (MDA)² or Maritime Situational Awareness (MSA)³, vital opportunities to detect and mitigate threats or critical vulnerabilities at the earliest opportunity may be lost.

It should come as no surprise that complex issues such as security, economic competitiveness, innovation, wealth creation, social welfare, resource management, environmental protection, political stability and climate change are inextricably linked to the maritime domain and our knowledge of it. Yet in 2015, when nearly every human being on earth has access to a telephone and the internet, maritime security collaboration and information sharing between multinational, inter-agency and private sector stakeholders which make up the Global Maritime Community of Interest remains ad hoc.

The evidence of failure in connecting maritime stakeholders together to achieve MSA is clear from the widespread inability of traditional nation-state maritime authorities to anticipate and address environmental, security, safety and economic concerns; a situation which is exacerbated by the acceleration of globalization and the growing number of stakeholders

¹ In postindustrial economies, we no longer produce but buy, and so we must ship. Without shipping, the world would not work. Freight shipping is the foundation of our civilization. See: George, *Ninety Percent of Everything*

² Defined by IMO as the effective understanding of anything associated with the maritime domain that could impact the security, safety, economy, or environment. See: IAMSAR Manual, p.3.

³ Defined by EU as the effective understanding of activities associated with and occurring in the maritime domain that could impact on the security, safety and environment of the EU and its Member States. See: EDA Fact sheet, p.1.

sharing maritime interests.

Fortunately, MSA and maritime security can be significantly enhanced without the need to invest vast amounts of money in research, innovation and new technology. High quality data is already collected from a variety of sensors and sources spanning the globe. The real challenge is to ensure that the right data gets to the right people in the right organization at the right time to achieve the desired outcome.⁴

This study examines a number of top down and bottom up approaches to enhance MSA and concludes that developing a robust governance structure, leveraging established Maritime Security Regimes (MSRs)⁵, and building on best management practices shows the most promise towards improved MSA.

⁴ EU Commissioner's Damanaki observation: "Today, about 40% of information is collected several times and 40% to 80% of information is not shared amongst the interested users. See: http://ec.europa.eu/archives/commission_2010-2014/damanaki/headlines/press-releases/2014/07/20140708_en.htm (Access 22 April 2015).

⁵ A MSR is a group of states and/or organizations acting together, with an agreed upon framework of rules and procedures, to ensure security within the Maritime Domain. See: Maritime Security Regime Manual and Enterprise Proposal, page i

2. Introduction

“The sea is common to all, because it is so limitless that it cannot become a possession of any one, and because it is adapted for the use of all. Nobody has the right to deny others access to it. Every nation is free to travel to every other nation, and to trade with it.”⁶

This MSA Study Paper reports on the findings of a multinational effort led by two NATO Centres of Excellence; the Combined Joint Operations from the Sea Centre of Excellence (CJOS COE) and the Centre of Excellence for Operations in Confined and Shallow Waters (COE CSW), in collaboration with the Multinational Maritime Security Centre of Excellence (MARSEC COE) and Beyond the Border Consulting Ltd., and supported by the NATO Maritime Interdiction Operational Training Centre (NMIOTC).

The MSA Review Project followed a logical, sequenced path. Beginning in 2008, a series of annual Maritime Security Conferences were organized by the CJOS COE and the COE CSW to improve international maritime security cooperation and awareness globally. These conferences generated considerable discussion regarding challenges and opportunities in maritime security collaboration.⁷



In October 2013, “Beyond the Border Consulting Ltd.” was brought onboard to help guide this study and to support planning and delivery of the

⁶ H. Grotius, *Mare Liberium*, p. 2

⁷ For more on this, see: CJOS COE and COE CSW, *MSC 2012 Proceedings & MSC Series Analysis Report*

subsequent phases of the project.⁸

At the outset of the project a gap analysis was conducted which was based on a wide range of perspectives gathered from across the Global Maritime Community of Interest (GMCOI)⁹. This vast and diverse GMCOI and their interests were grouped into three main stakeholder “communities”:

(i) governments as “regulators/enforcers/defenders” of their maritime interests;

(ii) private sector stakeholders as “suppliers/users/ consumers” of the maritime domain and global supply chain; and

(iii) researchers and academic stakeholders as “innovators/ solution providers” to help to better understand the complexities and interdependencies of the maritime domain.

For the purposes of this study, the terms MDA and MSA are used interchangeably. Whilst acknowledging that there are minor differences in definitions, the goal of both is to develop a comprehensive, shared understanding of the maritime domain in order to enable timely, accurate and well informed decisions and actions.

The study also sought to gain an understanding of key factors affecting the maritime domain including: time, space, risk, oceanography, geography, demography, the global supply chain, critical infrastructure, the environment, as well as the readiness, capacity and willingness of government and private sector stakeholders to anticipate and respond to activities in the maritime domain.

⁸ Beyond the Border Consulting Ltd. is a Canadian based firm. Throughout the project, the consultant conducted regular in-progress reviews to ensure that the project was meeting stakeholder expectations.

⁹ GMCOI includes, among other interests, the federal, state, and local departments and agencies with responsibilities in the maritime domain. Because certain risks and interests are common to governments, businesses and citizens alike, community membership also includes public, private and commercial stakeholders, as well as foreign governments and international stakeholders. See: 2013 The National Strategy for Maritime Security: NMDAP.

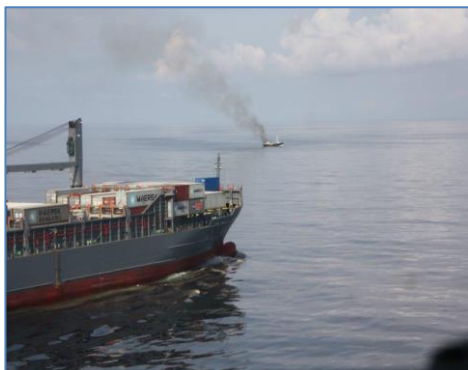
3. Context

3.1. Purpose

This MSA study is meant to serve as a promotional paper and advisory guideline for interested parties. Emphasis is placed on the improvement of individual stakeholder MSA efforts as well as to advocate for improved governance and collaboration between the International Maritime Organization (IMO) and the various Maritime Security Regimes which span the globe.

3.2. Problem

The study examines the following problem statement: *“In an increasingly inter-connected, inter-dependent and rapidly changing globalized world, there continues to be an absence of habitual and persistent relationships between key stakeholders in the GMCOI, which is essential to enhancing MSA.”*¹⁰



3.3. Hypothesis

The security, safety and overall health of the maritime domain as well as the efficiency and resilience of the global supply chain, which is reliant on the world’s oceans and waterways, concerns both the physical flow of materials and goods as well as information flow from origin to destination. In MSA, as in a supply chain, there is little benefit if certain links or stakeholders are maintaining habitual and persistent relationships while others are not, or if there are shortfalls in information sharing and collaboration among stakeholders. It is the total performance of these highly complex systems that is relevant, and each link in the chain is dependent on the strength of every other link. The world has become a system of systems in which people, cargo,

¹⁰ Conclusion derived from CJOS and CSW COEs’ Maritime Security Conference series. For more on this, see: CJOS COE and COE CSW, MSC 2012 Proceedings & MSC Series Analysis Report, p. 15.

conveyances, information, the physical environment as well as real and virtual infrastructure are linked into intricate patterns of dependency with other inter-modal transportation methods and facilities spread around the world; and, in fact, the maritime domain cannot be looked at in isolation from the air, space, land and cyber domains due to the various dependencies and inter-dependencies of this complex and highly competitive system of systems.

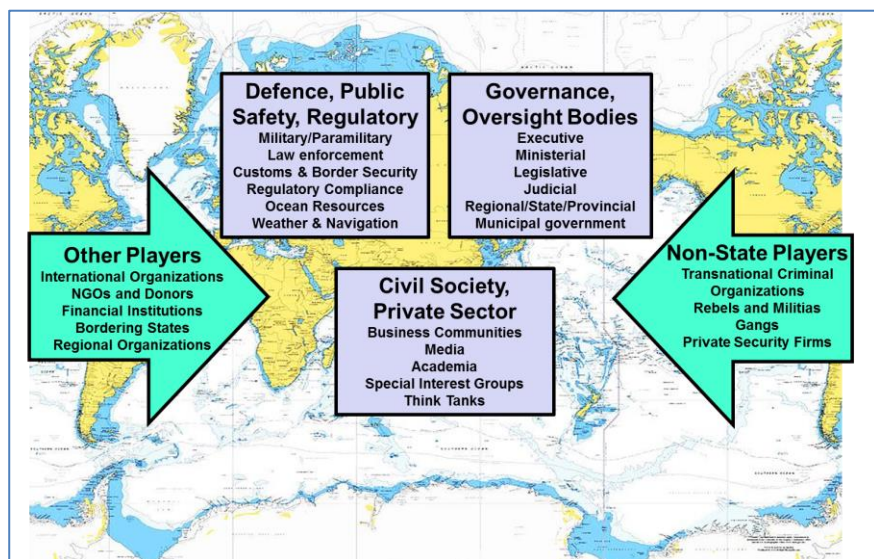


Figure 1: Diverse Global Stakeholders

Maritime Security Regimes were created or evolved to meet specific requirements and tend to focus on regional issues and within a limited scope. However, MSA is a global challenge which requires a global approach. With this in mind, the following hypothesis was employed throughout the study:

The establishment of habitual and persistent relationships between stakeholders across a wide spectrum at all levels, from governance and law making, to regulatory and enforcement functions, and to the business community, will significantly enhance maritime situational awareness.

4. Materials and Methods

The development of this MSA Study Paper followed a four phase approach:

Phase I – Multinational workshop to identify the current state of global MSA

Phase I was structured around a global MSA Review Workshop held in Istanbul from 9-11 October 2013. A rich blend of military and civilian subject matter experts, including legal advisers, representing the Centres of Excellence (COE), NATO, the EU, and Asia-Pacific partner nations identified shortfalls in global maritime information sharing and collaboration.

The workshop identified 62 gaps¹¹ distilled from a baseline assessment conducted by the combined COEs. By using the eight capability areas of doctrine, organization, training, material, leadership, personnel, facility and interoperability (DOTMLPFI)¹² as a guiding framework, each of the components essential for MSA capability was examined.

Phase II – Gap analysis research project

During the analysis of the findings of the first workshop an extensive correlation was done with other relevant national studies to identify additional gaps. This gap list was then distilled down into a new original model made up of the eight Capability Focus Areas listed below:

- Modern, adaptive and agile governance structures
- Understanding of the Maritime Sector and Maritime Affairs
- Awareness of stakeholder authorities and interests
- Decision-making
- Critical information requirements
- Collection of warning to response processes
- Information sharing best practices

¹¹ For more on this, see: CJOCS COE and COE CSW websites
[http://www.coecsw.org/fileadmin/content_uploads/MSA_review/
Gap_Inventory_Master_Final_4_Dec_13.xlsx](http://www.coecsw.org/fileadmin/content_uploads/MSA_review/Gap_Inventory_Master_Final_4_Dec_13.xlsx) (Access 23 September 2014)

¹² For more on this, see: Wikipedia. <http://en.wikipedia.org/wiki/DOTMLPFI>
(Access 23 September 2014).

- Innovation, technology and standards

Phase III – Multinational workshop to identify enablers and potential solutions

A second Global MSA Review Workshop was held in Souda Bay, Crete from 18-20 February 2014. This workshop was conducted to identify potential solutions and enablers which could close the gaps and improve MSA over the short, medium and long term. The workshop agenda was divided into six discussion sessions addressing the eight Capability Focus Areas. In addition to the discussion sessions, all attendees were encouraged to fill out participant worksheets to state their expert views regarding potential solutions to the gaps which could not be addressed during the workshop. This allowed additional inputs and clarifying comments to be placed “on the table”.

Phase IV – Analysis and key findings

Before and after the second workshop in Souda Bay, a rigorous and methodical review of open source material from around the world took place. Particular effort was taken to examine perspectives from the developing world, areas of friction, NGOs, the Non-Aligned states and those stakeholders with traditionally “continental” rather than maritime histories in order to gain an appreciation of how the complex maritime domain is perceived and understood by diverse cultures, mindsets and sentiments as well as the motivation of key influencers (both inside and outside of government). The aim was to finally validate, discount, or add to the original 62 gaps and 8 Capability Focus Areas and develop potential solutions or solution enablers to be included in this study. The evaluation does not attempt to provide a detailed list of every possible solution to every gap; rather it attempts to provide a general overview of the ongoing discussion and provide a few examples of potential solutions and enablers.

5. Results

5.1. Situation

MSRs operate according to their mandates; whether that is to perform fisheries control, customs enforcement, policing and intelligence gathering, or maritime traffic control, predominantly in their specific Area of Responsibility (AOR) and jurisdiction. Threats that emerge outside of, but eventually transition into the monitored AOR, take time to detect, identify and classify by an individual MSR because one will rarely have the ‘full picture’. Regional ‘discoveries and detections’ may be based on scanty, incomplete or incorrect reports without the benefit of amplifying information which could be provided from adjacent MSRs or other sources of information and intelligence.



Take for example the following scenario: Many MSRs are unable to detect, identify and track small vessels which may have been detached from a mother ship on the high seas. Vessels such as these could be used to transport illegal arms, narcotics, illegal migrants or even WMD to a

harbour, likely remaining undetected throughout most of the voyage. The advent of AIS has provided some MSRs with the capability to gather MSA baseline data regarding larger vessels, however, data regarding smaller vessels or non-compliant vessels may not be readily available (Note: vessels less than 300 gross tons are currently exempt from providing AIS data and may not be required to report into vessel traffic management systems).¹³

This highlights one handicap of individual MSRs operating in isolation from other MSRs.¹⁴ Their operational picture is likely tailored to its task only

¹³ See also “MDA Challenges”, U.S. National MDA Plan, Appendix C, p. C-1

¹⁴ Maritime Security Regime Concept: “A Global Approach to Regional Challenges”, p. A-13

and covers a very specific Area of Responsibility (AOR) or Area of Interest (AOI) in order to satisfy organization-specific information requirements. Situational awareness is therefore incomplete vis-a-vis threats, risks or vulnerabilities beyond the specific jurisdiction and AOR/AOI of certain MSRs.

Activities in the maritime domain may have global threat implications, however, unlike the well-governed air domain; the high seas are significantly less controlled than the skies above. Whereas the International Civil Aviation Organization (ICAO)¹⁵ maintains direct responsibility for managing close to 100,000 daily flights across the global air transportation network, the International Maritime Organization (IMO) has little real authority to manage and oversee global shipping activities and standards or enforce the United Nations Convention on the Law of the Sea (UNCLOS)¹⁶.

Maritime terrorism, with or without weapons of mass destruction (WMD), could involve attacks directed against vessels, harbours/ anchorages, fixed land-based targets near ports such as oil refineries, oil storage depots, energy pipelines and undersea cables, and other threats to vessels and critical infrastructure.¹⁷ The threat also includes the use of maritime assets as platforms to smuggle terrorist materiel and/or terrorists that could deliver attacks against vessels at sea, port facilities or population centres. Although not widely known, acts of maritime terrorism, piracy and other transnational criminal activities have been prolific in the first decade of the 21st century.¹⁸

¹⁵ See also: <http://www.icao.int/about-icao/Pages/default.aspx> (Access 09 October 2014).

¹⁶ See Bateman's observation: "The challenge in building an effective regional maritime security regime is to recognize the limitations of UNCLOS and to negotiate a regional consensus." Bateman, UNCLOS and its Limitations, p.1

¹⁷ For more on this, see: The UK national strategy for maritime security

¹⁸ Terrorist groups like the Liberation Tigers of Tamil Elam, the Abu Saaaf Group, and the Moro Islamic Liberation Front have used fast speed boats and even combat vessels to attack targets on land or to attack naval vessels at sea. The October 2000 attack on the USS Cole in the port of Aden in Yemen was delivered by a fast speed boat, as was the case with M.V. Limburg in 2002.

Aside from the national security aspects of such incidents, these threats can have a devastating impact on economic prosperity, global supply chain security and public confidence. The bottom line is that many of our modern comforts and expectations are put at risk by the failure of GMCOI stakeholders to contribute to the maintenance of a comprehensive, shared understanding of the maritime domain necessary to enable timely, accurate and well informed decisions and actions.¹⁹

5.2. Problems identified

5.2.1. Modern, adaptive and agile governance structures

The lack of modern, adaptive and agile global and regional governance structures has generated friction between the globalized corporate sector, maritime authorities and policy-makers. The friction undermines the creation and maintenance of habitual and persistent relationships across the GMCOI necessary to enhance MSA. Particularly in developing nations and/or in areas of conflict, there may be a complete absence of effective governance or management structures. Although in the aftermath of the 9/11 attacks the international community endeavored to improve global coordination and governance in the air domain, such robust efforts did not extend to the maritime domain.²⁰ This is aggravated by the fact that no single organization seems capable or interested in assuming the coordinating function in the interest of improved global MSA. This lack of a champion to coordinate collaboration has led to the systemic failure of traditional nation-state maritime authorities to holistically address the wider environmental, security, safety and economic concerns of the maritime sector. This is exacerbated by the acceleration of globalization and the willingness of the corporate sector to

For more information, see: <http://www.trackingterrorism.org/article/maritime-terrorism> (Access 23 September 2014).

¹⁹ McQuaid, *Maritime Security; Strengthening International and Interagency Cooperation*, pp. 4-5.

²⁰ The EU's Air Traffic Management implies de-fragmenting the European airspace and increasing safety standards. See: http://ec.europa.eu/transport/modes/air/single_european_sky/. (Access 24 September 2014).

“work around” national authorities, borders and jurisdictions to achieve their aims, instead of working as partners with national authorities.

5.2.2. Understanding the Maritime Sector and Affairs

Across the GMCOI, there is a lack of understanding that security, economic competitiveness, innovation, wealth creation, social welfare, resource management, environmental protection and political stability are inextricably linked to the maritime domain. Covering nearly three-quarters of the earth’s surface and holding 97% of the planet’s water, oceans are the lifeblood of our planet and humankind. The oceans produce more than half the oxygen in the atmosphere, support the greatest biodiversity on the planet and are one of the largest carbon dioxide (CO₂) reservoirs, holding up to 54 times more CO₂ than the atmosphere. With 44% of the world’s population living within 150 km of a coast, the maritime domain has a significant impact on our lives. About 95% of the world’s telecommunications travel via undersea cables; 90% of the world’s commerce being transported by sea and 50% of the world’s oil transits seven major global choke-points. In this increasingly dynamic, interconnected and interdependent globalization world, without an understanding of the maritime domain it is difficult to identify areas of mutual interest upon which to build trust and cooperation.

5.2.3. Awareness of stakeholder authorities and interests

There is a general lack of awareness of who the key stakeholders are across the GMCOI.²¹ What are their authorities, mandates, jurisdictions, capabilities and interests? An understanding of who makes up the GMCOI is required to encourage the interaction necessary to identify organizations, partnerships, best practices, and other efforts that enhance MSA.

5.2.4. Decision-making

There is a lack of understanding of what types of decisions are made by various GMCOI stakeholders and the underlying rationale behind these decisions. The purpose of MSA is to develop a comprehensive shared

²¹ McQuaid, Maritime Security; Strengthening International and Interagency Cooperation, p. 6.

understanding of the whole maritime environment. This awareness must enable timely, accurate and well-informed decisions and actions in order to build and sustain favorable conditions for global maritime security, economic prosperity and resource management, and to manage the impacts of climate change. An understanding about the types of decisions which might be made by maritime stakeholders will help to define the underlying layers of data, information and knowledge necessary to enable timely and well-reasoned decisions and actions. This understanding is required to support decision-making by partner MSRs and possibly incentivize information sharing and collaboration when stakeholder interests intersect.

5.2.5. Critical information requirements

Critical information requirements are those key elements of information which directly support well-reasoned and timely decision-making. Without an understanding of what type of information is important to a particular stakeholder and when it is required in terms of time, space and prudent risk management, there is little incentive to share information or data. Collecting and sharing critical information is complicated from a legal, regulatory and practical standpoint. For reasons of national policy, data that government agencies can collect, retain, and share with others may be limited. In many cases, there are good reasons why information on a particular vessel, cargo, crew member, owner, destination or financial transaction is not shared between regulatory, law enforcement, defence officials, or between government and the private sector, from a prosecutorial standpoint. Regarding information gathered and held by the private sector, the maritime domain remains blessed and cursed by hundreds of years of history. Within the global shipping industry, the tradition seems to continue to be largely characterized by a culture of secrecy due to the desire to safeguard the competitive advantages afforded by the vast, largely ungoverned and un-policed spaces of the global maritime commons.²²

5.2.6. Process from Collection to Warning and Response

The process from collection to warning to response, as well as critical

²² See Annex A for more information about critical information requirements.

timelines and response capabilities vary across the GMCOI. These processes are shaped by such factors as time, space, risk, vulnerability, geography, environment, global supply chain operations, market conditions, the status of critical infrastructure, the environment, readiness, location and willingness of government and private sector stakeholders to respond. Currently, maritime information is collected and stored by a wide variety of agencies and organizations. Alert or warning procedures and assessment criteria vary by organization and/or decision-maker as do response processes. Many stakeholders will be reticent to disclose particular strengths or weaknesses in their capabilities or readiness; however, a general understanding of these factors is necessary to encourage greater information sharing and collaboration.

5.2.7. Information Sharing Best Practices

Routine information sharing appears to be a neglected practice among the GMCOI and MSRs, and no single international authority has stepped forward to manage this issue. Such is not the case in the air domain where, for a long time, the ICAO and the International Air Transport Association (IATA) have demonstrated the utility of collaboration between governmental and non-governmental organizations.

ICAO is an inter-governmental and UN specialized agency with 191 signatory states that represent aviation interests and authorities. It establishes standards, recommends best practices, and provides guidance for aviation safety, security, and efficiency, as well as environmental protection. IATA as the global airline industry association acts for most major scheduled airlines, joining together about 240 airlines responsible for 94% of all international flights. Both organizations have a long and successful history of cooperation.

In the maritime domain, the International Chamber of Shipping (ICS)²³, as the principal international trade association, does not have a comparable position to IATA when it represents the world's ship-owners to the IMO and other regulatory fora.

²³ For more on this, see: <http://www.ics-shipping.org/>
(Access 29 September 2014).

5.2.8. Innovation, Technology and Standards

The ability to develop new MSA capabilities and services, to find novel uses for existing products, to locate risk capital, and to develop new markets for MSA capabilities and services are key considerations for GMCOI stakeholders. The workshop participants articulated the concern that innovation and technology developments, particularly in the fields of defence and security, are generally sensitive national matters. Opportunities to develop, sustain, and advance the production of MSA related products and services need to be expanded. In any case, safeguarding sensitive national and commercial proprietary information needs to be considered. Unfortunately security and defence projects are costly and slow because they are generally subject to highly bureaucratic processes. This dilemma is exacerbated by a defence and security industry that has become more and more consolidated creating near-monopoly situations in many countries.

Specific gaps identified during the workshop included a deficiency in the number of intelligence, surveillance and reconnaissance (ISR) sensor platforms at sea, and sporadic sharing of coastal and space-based sensor data. MSA detection, identification, classification, and tracking primarily relies on AIS, complemented to a lesser or greater degree, by other means such as satellite, radar, visual observations and a variety of mandatory and voluntary reporting schemes. Contact detection, identification, classification, and tracking mainly rely on AIS data that is assumed to be correct and not manipulated. In the very practical case of small ships <300GT (e.g. dhows, speed boats) MSRs lack even the baseline data of position and intended movement because of their exemption from AIS compliance. This situation has resulted in a significant awareness gap.²⁴

5.3. Fields of Action

5.3.1. Modern, adaptive and agile governance structures

There are messy problems and there are hard problems. Achieving

²⁴ See MSA gaps observed and evaluated throughout the COEs' study work, http://www.coecsw.org/fileadmin/content_uploads/MSA_review/Gap_Inventory_Master_Final_4_Dec_13.xlsx (Access 23 September 2014)

effective, modern adaptive and agile maritime governance structures on all levels (national, regional, global) is a particularly messy challenge, in part, because one cannot manage what one cannot measure. Two examples stand out for further examination as possible tools to help foster further discussion.

- Maritime Security Sector Reform (MSSR) guide

The 2010 MSSR guide²⁵ is an analytical tool designed to map and assess the maritime sector, to assess existing maritime security sector capabilities and gaps, and/or to enable coordination and collaboration to improve maritime safety and security. The guide can be used by a wide range of GMCOI stakeholders. It is based on standards and best practices from a variety of sources and does not embody the practice or standards of any particular country or region. It can be used to support a full-scale maritime sector assessment, to obtain a snapshot of one or more aspects of a country's maritime sector, or to facilitate discussion among national actors with maritime responsibilities.

- 2050 Africa's Integrated Maritime Strategy (2050 AIM Strategy)

The 2050 AIM Strategy²⁶ and the accompanying Annex C Plan of Action for Operationalization was adopted by the African Union in December 2012. The Strategy and Plan of Action constitutes a road map primarily aimed at outlining the global objectives pursued in the bid to improve Africa's maritime economy. It addresses the major activities, actions, and the lead institutions responsible for the implementation of the activities. The objectives cover short, medium and long term projections for new institutions and structures. The strategy shows ways for wealth creation and human resource development as well as capacity building for maritime governance. It is a remarkable undertaking given the complexity of African affairs and it provides

²⁵ For more information, see: <http://www.state.gov/documents/organization/154082.pdf> (Access 23 September 2014).

²⁶ The 2050 AIM Strategy is the product of cross-cutting inputs from African experts. It provides a broad framework for the protection and sustainable exploitation of the African maritime domain for wealth creation. For more on this, see: The 2050 AIM Strategy.

a case study into how mutual interest can be a powerful motivator to drive change.

5.3.2. Understanding the Maritime Sector and Affairs

Great storytellers take time to understand what their listeners know about, care about, and need to know and then bring them along on a journey through the story. The reality is that in today's interconnected world, information is everywhere and the volume, speed and ferocity of conversations has grown exponentially. Narratives are no longer shaped by thorough research, credible evidence and thoughtful analysis, but rather by tweets, texts and a 24/7 infotainment news cycle. Good examples for this are the disappearance of flight MH370 and the sinking of the ferry SEWOL as case studies into both "Schadenfreude" and maritime blindness.

The MSA project concluded that the torrent of information delivered via modern methods can give decision-makers an unprecedented opportunity to shape the story by tailoring the narrative to various global stakeholder groups on the basis of their knowledge, assumptions, beliefs and values concerning the maritime domain and how it touches their world – in effect, reducing complex issues into understandable stories that influence behavior. The MSA Study found that while governments are key stakeholders, a small "Global Maritime Leadership Panel" made up of influential and credible figures from industry, media, academia and non-governmental and intergovernmental organizations (NGOs/IOs) should drive the development of the overall storyboard. There are many annual gatherings of the global political and business elite to discuss the issues of the day; the annual World Economic Forum held in Davos-Klosters, Switzerland, may be the best known forum to bring together such a global leadership panel to champion this complex issue in a spirit of global citizenship.²⁷

5.3.3. Awareness of Stakeholder Authorities and Interests

During the MSA Workshops both "bottom up" and "top down" solutions were proposed to build an authoritative list of the three key

²⁷ For more on this, see: <http://www.weforum.org/>
(Access 23 September 2014).

stakeholder groups and their interests. Some workshop attendees suggested that the simplest way of collecting and identifying stakeholders would be to do it nationally and then pass this information upwards and horizontally during regional and multinational fora.

It was also suggested that an international body such as the UN or IMO should take the responsibility to develop an authoritative list of global and regional stakeholders. Some delegates favoured creating a globally accessible and updateable visualization tool or map stakeholder categories, groupings and relationships. Unfortunately, there is no easy solution to this challenge. The Yearbook of International Organizations contains detailed profiles of over 67,000 organizations active in about 300 countries and territories (approximately 1,200 new entries are added each year), as well as profiles of organizations, specifics on activities, events and publications.

At an annual online subscription price of €2,430 / \$3,230 it is beyond the means of many to purchase and in any event, it provides very little insight into the identification of key maritime stakeholders, decision-makers and decision influencers across the spectrum of MSA interests.

Identifying key stakeholders across the GMCOI as well as their authorities, mandates, jurisdictions, capabilities and interests is another messy problem. However, the Maritime Security Regime (MSR) Concept and Guide²⁸ and the U.S. National Concept of Operations for MDA, provide useful insights into net-enabled, trans-regional, inter-agency collaboration. Both guides provide useful references to expand the discussion to other stakeholder groups.

A notable activity to approach the GMCOI was undertaken by the U.S. National MDA Coordination Office (NMCO). NMCO facilitated two Global Maritime Information Sharing Symposia (GMISS) in 2009 and 2010 to align U.S. government outreach to the maritime industry and improve and increase industry-government maritime information sharing partnerships. (Note:

²⁸ The MSR Manual addresses MSR processes and capabilities regarding building new MSRs and providing sustained global enhancement or improvement of existing MSRs. For more information, see: MSR Manual and Enterprise proposal.

NMCO's functions have recently been assumed by the U.S. National Maritime Intelligence Integration Office or NMIO).

5.3.4. Decision-Making

While there are many possible combinations and permutations of decisions which could be made in the maritime domain, the MSA Study identified the following major types of high-level decisions which reasonably might be made by GMCOI decision-makers:

Governance/Management: impose standards, rules and regulations.

Capacity Building: establish civil control, establish security forces, and establish essential services, support economic and infrastructure development, conduct regional/ global engagement to build capacity.

Operational Response: implies the GMCOI stakeholders taking any or all of the following types of action: anticipate, collect information and intelligence, collaborate and share information and intelligence, assess risk, warn, plan, generate capability, deploy/ preposition, take decisive action, manage consequences, redeploy, regenerate expended capabilities, and collect/ apply/ share lessons learned.

Supply Chain Management: collect business intelligence (supplier/ customer), raise capital, production, warehousing/ supply chain management, on time delivery/ maximize return on investment, manage disruptions/ changing market conditions, learn, innovate, expand, evolve.

From Fragmented Sea Surveillance to Coordinated Maritime Situational Awareness

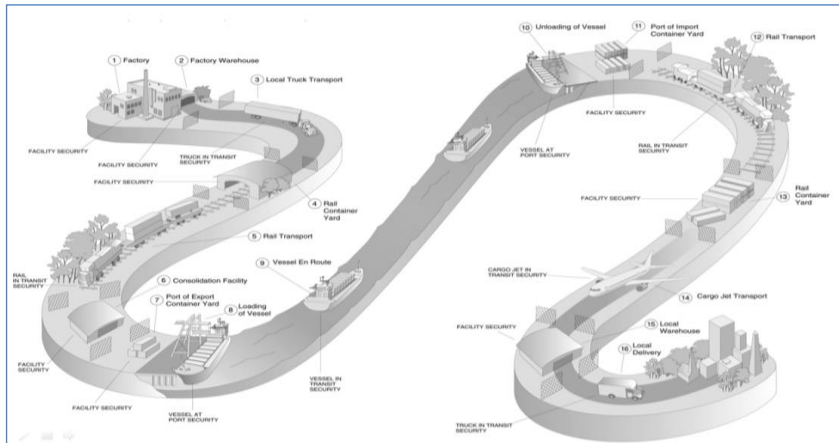


Figure 2: Complex Supply Chain

Business Innovation: collect business intelligence (supplier/ customer), raise capital, research and development, innovate, demonstrate, prototype, full production, on time delivery, maximize return on investment, manage disruptions/ changing market conditions, create value added services, learn, innovate, expand, evolve.

MSA Specific: MSA specific decisions cut across all the above areas, however, the research revealed discrete decisions related to the collection, fusion and analysis, dissemination and management of MSA-related activities as follows:

- Collect - Develop requirements and collect all-source data;
- Fuse and Analyze - The process of combining data and information from all sources into an integrated product from which significant and actionable knowledge can be derived. This includes assessing situations, identifying anomalous behavior, determining relationships, estimating or predicting activity/ intentions, or assessing potential impacts of changes, threats, risks and vulnerabilities;
- Disseminate - Communicate and make available the required level of data and information to all authorized participants;

- Manage - Improve and/or establish procedures to receive, process, assess, and display information; provide tasking and support decision making across the GMCOI. Management includes training, education and applying lessons learned.

5.3.5. Critical Information Requirements

Critical Information Requirements are those key elements of information which directly support well-reasoned and timely decision-making. The MSA Project concluded that without an understanding of what type of information is important to a particular stakeholder as well as when it is required, there is little incentive to share information or any underlying layers of data between stakeholders. Vague and incomplete information provided too early is of limited utility to decision-makers; just as precise information provided “late to need” is of little value. The December 2010 edition of PHALANX, published by the Military Operations Research Society (MORS), introduces the Maritime-Timeline Analysis and Requirements Toolset (M-TART) developed by Defense Research & Development Canada – Centre for Operational Research and Analysis to help decision-makers and their staffs understand the relationship between decisions, requirements, time, space and risk. While M-TART was developed to support decision-making in response to maritime threats to North America, with a little imagination, this model could be applied to just about any scenario where decision-makers need to manage time, space, risk and resources in a dynamic maritime environment.

5.3.6. Process from Collection to Warning and Response

While it would be unrealistic to expect the GMCOI to adopt a single collection to warning to response process, the *Operational Maritime Domain Awareness Process* (OMDAP), developed by North American Aerospace Defence Command and U.S. Northern Command (NORAD-USNORTHCOM), is worth examining as a potential model for collaboration across a wide range of diverse stakeholders. In 2009 NORAD-USNORTHCOM sponsored the three-year Joint Integration of Maritime Domain Awareness (JIMDA) Joint Test to develop and test joint Maritime Domain Awareness tactics, techniques and procedures across Canadian and U.S. homeland security-focused federal

inter-agency, multinational and commercial partners through a series of war games, exercises, and conferences aimed at improving collection through warning through response processes.²⁹

5.3.7. Information sharing best practices

To promote efficiency and unity of effort across the GMCOI and to facilitate the secure, safe, efficient and resilient operation of the global supply chain, it is necessary to leverage existing policies, processes and best practices and, where appropriate, propose new multilateral information sharing agreements, arrangements, and/or international conventions and treaties. Because of the inter-connected and inter-dependent nature of the maritime domain, the reality is that even the most advanced and well-funded organizations and nations can only achieve a limited level of maritime awareness without collaboration and information sharing arrangements. However, significant enhancements to shared situational awareness and management efficiencies could be achieved by combining current efforts and sharing existing data and information resources with other partners. Massive quantities of data are collected and stored on a given day by a variety of public and private sector entities, and much of this data is likely “sharable” across the GMCOI. Data and information which might appear to be benign to one stakeholder could, if shared in a timely fashion across a worldwide network of MSRs, contribute to a comprehensive shared understanding across a vast global network of MSRs and GMCOI stakeholders.

Notwithstanding that much work still lies ahead, a number of best practices have already emerged. Some examples include:

- (1) Collaboration in terrestrial and space-based commercial Automatic Identification Systems (AIS);
- (2) Common Information Sharing Environment for the surveillance of the EU maritime domain in Europe (CISE);
- (3) National Maritime Domain Awareness Plan (US NMDAP) for the

²⁹ For more on this, see: JIMDA Fact Sheet, U.S. DOD, Executive Agent for Maritime Domain Awareness.

National Strategy for Maritime Security in the U.S.;

- (4) US National Maritime Information Sharing Environment (MISE);
- (5) Maritime Safety and Security Information System (MSSIS);
- (6) Long Range Identification and Tracking (LRIT);
- (7) Counter-Piracy Best Management Practices (BMP);
- (8) The International Ship and Port Facility Security (ISPS) Code;
- (9) Single Integrated Lookout (SILO) list;
- (10) Vessel of Interest (VOI) Lexicon;
- (11) Commercial visualization and collaboration technologies and applications; and
- (12) Supply chain security initiatives, such as the Framework of Standards to Secure and Facilitate Global Trade of the World Customs Organization (SAFE Framework), the U.S. Customs-Trade Partnership Against Terrorism program (C-TPAT), Canada's Partners in Protection program (PIP), and other national and multinational Authorized Economic Operator programs.

The Common Information Sharing Environment for the surveillance of the EU maritime domain in Europe (CISE)³⁰ and the US National Maritime Information Sharing Environment (MISE) show considerable promise and are worthy of deeper discussion. CISE can be seen as the marine response to the European Commission's Single European Sky initiative by which the design, management and regulation of airspace is coordinated throughout the EU. CISE proposes an interoperable and trusted cross-sector data exchange between public administrations across seven policy areas (maritime safety and security, marine environment and pollution preparedness and response, fisheries control, border control, law enforcement, customs and defence) within the EU maritime domain. As an important milestone towards CISE

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http://ec.europa.eu/maritimeaffairs/policy/integrated_maritime_surveillance/documents/integrating_maritime_surveillance_en.pdf (Access 22 April 2015)

implementation, the Cooperation Maritime Surveillance Project (CoopP) group recently, in March 2014, completed its test project on cooperation. The Final Report, which was submitted to the European Commission, outlines project results and recommendations for the next steps to be achieved by its 28 partners from currently 12 participating EU countries.

On the other hand, the MISE describes an internet accessible, unclassified information sharing capability where data providers and consumers manage and share maritime information through common data definitions and security attributes. MISE defines a service oriented architectural approach that allows participation across multiple agencies and stakeholders while protecting individual information and resources.

5.3.8. Innovation, technology and standards

Clearly, there are numerous interests at stake in addressing this eighth and final capability focus area and there is no silver bullet which will address this gap area. Rather than propose a long and invariably incomplete list of potential technology solutions, the study research examined a variety of tools and models which could assist in improving the entire process from technology innovation to full production but also for the realization of data exchange standards and processes.

The Capability Maturity Model (CMM)³¹ and the Maritime Domain Awareness Capability Maturity Model³² are worth examining as tools to improve technical innovation processes. The Maritime Domain Awareness Capability Maturity Model, in particular, provides decision-makers with metrics to determine return on investment and gauge how well a user is achieving enhancements in MSA and overall maritime security.

Other areas for further examination include the sharing of data

³¹ CMM is a registered service mark of Carnegie Mellon University (CMU). More information on the model's five-level maturity continuum, see: http://en.wikipedia.org/wiki/Capability_Maturity_Model (Access 23 September 2014).

³² http://www.dodccrp.org/events/18th_icrts_2013/post_conference/papers/123.pdf (Access 23 September 2014).

acquired through existing coastal and shipborne radar as well as more modern technology e.g. satellite AIS (S-AIS), synthetic aperture radar (SAR), long range identification and tracking (LRIT) etc. Networks to share existing data between MSRs would vastly improve MSA coverage and management. The Virtual Regional Maritime Traffic Centre³³ (V-RMTC), for example, shares regional baseline data such as AIS information with all its member navies. The “Collaboration in Space for International Global Maritime Awareness”³⁴ (C-SIGMA) Centre goes one step further by seeking to collect and share a variety of unclassified data acquired through space-based sensors. C-SIGMA allows even modestly funded and equipped MSRs to procure global space-acquired data without investing in its own space program.

³³ <http://www.5plus5defence.org/sites/EN/PagesEN/V-RMTC.aspx> (Access 30 October 2014)

³⁴ <http://c-sigma.org/mission> (Access 30 October 2014)

6. Discussion

6.1. Opportunities

Across the eight capability focus areas, a single improvement in one area could result in a positive effect across other areas of the entire MSA enterprise. Improved information sharing can only be achieved with a modern and adaptive



governance structure and leadership that understands maritime affairs and supports other maritime sectors. Collaboration opens the door to information sharing, and is the key to effective domain awareness, responsiveness and safeguarding activities.³⁵

Without an understanding of what type of information is important to a particular stakeholder there is little incentive to share information. A series of facilitated workshop attended by global MSRs to discuss their respective authorities, mandates and interests would go a long way towards open the door towards deeper collaboration. A notable success story in this regard involves the decision of Denmark, the Netherlands, Norway and the United Kingdom followed by Australia³⁶ and recently the United States of America to join the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP)³⁷. This partnership provides some evidence of the growing understanding of the relationship between regional security concerns and their impact on stakeholders on the other side of the world.

6.2. Barriers and Obstacles

The thesis about the absence of habitual and persistent relationships between key stakeholders in the GMCOI becoming a main obstacle towards enhanced MSA was confirmed. During the various engagements in maritime

³⁵ Ansell & Gash "Collaborative Governance in Theory and Practice"

³⁶ Australia "Guide to Australian Maritime Security Arrangements", p. 108.

³⁷ <http://www.recaap.org>. (Access 24 September 2014)

collaboration, the COEs repeatedly came up with the conclusion that collaboration and information sharing business is still conducted in an ad hoc fashion.

So what are the barriers that have prevented the GMCOI stakeholders from achieving the necessary levels of collaboration and information sharing? Information sharing is not a technical problem. A simple telephone or internet email system is sufficient to enable basic collaboration across multiple time-zones and across the GMCOI, and does not require an elaborate command, control, communication and computer (C4) system. Routine contact between MSRs, even to exchange pleasantries and the local weather starts the process and over time more habitual and persistent collaborative relationships would emerge. So why is this not occurring?

The reason is simple, the absence of a governance structure upon which to build and maintain daily, habitual and persistent relationships between stakeholders.

At its most basic level, while legal authorities and information sharing policy may be clear to policy makers and lawyers, at the level of the individual analyst, operator or watch supervisor, it is much less clear about what information can be shared, with whom, and under what circumstances.³⁸ Policies, processes and procedures need to be developed and enforced to provide guidance regarding the collection, management and dissemination of relevant and timely information between stakeholders. These processes need to have sufficient granularity as to answer the following 2 key questions:

- What is the “threshold” to share in terms of time, space, threat, vulnerability and consequence?
- If the threshold to share has been met, what information can be shared, with whom is it shared, when is it shared and how is it shared?

³⁸ As Eric Lehre found out: “There seems to be no valid reason for these laws to impede the flow of information from one department to another.” See: Avis & Hales, Canadian MDA – Why is it so Important?, p. 1.

6.3. Benefits

Data and information acquired from national, regional and inter-regional MSRs could contribute to a vastly improved recognized maritime picture. The fact that no single department or agency, let alone individual nation, has the capacity to achieve and maintain full MSA on its own, highlights the need for a cross-regional or global MSA network. Such a collaborative system of systems approach would likely achieve significant cost savings and efficiencies. The CoopP group, in its final report, estimates the potential financial benefits associated with the analyzed information services for the EU between



EUR 176 million and 423 million per year. These numbers refer to the cost-effectiveness in the annual operating costs of maritime surveillance in Europe.³⁹ The success and return of investment of improved and effective MSA depends on the engagement and active contribution from all three stakeholder groups; government, the private sector and research/ academic communities.

6.4 Necessary MSA Capabilities

MSRs need to enhance situational awareness not only within their particular areas of interest and responsibility, but consider the information needs of other MSR and the wider GMCOI. By collecting and sharing separate pieces of information regarding people, cargo, conveyances, and financial or transactional data from a wide array of multinational, and inter-agency stakeholders from adjacent and far-flung MSRs as well as information made available from the maritime industry and other non-governmental organizations, it is conceivable that the GMCOI could track of the position and

³⁹ For more on this, see: CoopP Final Report, p.16
http://www.coopp.eu/images/final_conf/Final_Report_CoopP_v4.pdf
(Access 23 September 2014).

status of virtually every sea-going vessel and possibly alert interested parties anywhere in the world regarding anomalous behavior or changes to patterns of life, thus warning of potential future risks.

Establishing maritime awareness based on the information flow at the national, regional and global level will require a high degree of coordination and cooperation due to the fact that a diverse set of stakeholders⁴⁰ is involved. The creation of a formal, global MSA steering organization – possibly under the umbrella of the IMO would assure unity of effort through consultation and coordination – and mark the first real step towards a more formal collaborative relationship.

To better manage the vast quantity of data and information which would be generated in such a collaborative environment, the real challenge is to ensure that the right data gets to the right people in the right organization at the right time to achieve the desired outcome. Consequently, well-defined Critical Information Requirements (CIR)⁴¹ need to be developed to ensure the disciplined, directed and vetted flow of decision-quality information to authorities to enable well-reasoned and timely decisions and actions while reducing data overload. Additionally, Liaison Officers, staff exchanges and MSR collaborative workshops would allow regional expertise to be shared between MSRs and help address cultural and linguistic barriers to collaboration. Finally, the promulgation and maintenance of up to date and preferably on-line accessible lists of single points of contact (telephone, email, social media handle etc.) for each MSR would aid in fostering a stronger culture of collaboration and information exchange. To achieve cross-cutting multinational, cross-sectoral, inter-agency cooperation, basic contact information needs to be made available and discoverable to interested parties.

⁴⁰ This will include government agencies, military, law enforcement, international organizations, NGOs, academia and the business sector.

⁴¹ See Annex A: Critical Information Requirements.

7. Future facilitation of MSA

7.1 General

There is a collective global interest to keep the oceans and sea lines of communication safe, secure and open to all. All nations are mutually dependent on trade and communication. This study examined a number of top down and bottom up approaches to enhance MSA and concludes that developing a robust governance structure, leveraging established Maritime Security Regimes (MSRs), and building on best management practices shows the most promise towards improved MSA; findings which corroborate the conclusions reached during earlier Maritime Security Conferences⁴².

In its current state, the absence of habitual and persistent relationships across the GMCOI continues to be reflected at all levels from governance and law making, to regulatory and enforcement functions, to the business community and has the potential to undermine the development and maintenance of effective national, regional and global maritime governance regimes, inhibit business innovation and wealth creation, and threaten the health of the planet.

The impact is substantial and includes almost all aspects of the business sector (capital and financing, sales and marketing, innovation, production, warehousing, supply chain management, reverse logistics etc.); all activities (safety, environment, security and defence, regulatory and resource management); all locations (from Asia and the European Union to the Americas, and from the Indo-Pacific region to the developing countries of Africa); and in particular every part of the jurisdiction and functioning of policy-making and its underlying governance and management from the international and global to the local and regional.

Hence we strongly advocate building future efforts based on the principles of the “MSR Manual and Enterprise Proposal” which states: “The dual approach of a Maritime Security Regime Enterprise and enhanced MSR

⁴² For more on this, see: CJOs COE and COE CSW, MSC 2012 Proceedings & MSC Series Analysis Report

collaboration in a global approach offers the best opportunity to meet the Maritime Domain access challenges of the future.”⁴³ Both approaches are complementary, and the sophisticated job of aligning and facilitating collaboration between the MSRs can best be done by a well-organized governance enterprise. This proposal is also in line with the U.S. as well as other Allied and national plans to organize the GMCOI stakeholders through improved governance to promote unity of effort across the GMCOI and to improve MDA.⁴⁴

The CISE initiative under the EU’s guidance also acknowledges this need and concludes that a collaborative environment can only become sustainable with a governance model that is light, flexible and decentralized.⁴⁵

7.2 Recommendations

While this study does not propose a particular global MSA governance structure, we do recommend that MSA stakeholders advocate for the establishment of a forum where stakeholders from across the Global Maritime Community of Interest can gather on a regular basis to share fresh ideas and lessons learned in the pursuit of solutions to the challenges described in this paper. Stakeholder engagement and advocacy in favor of creating a sub-working group of the World Economic Forum might be a logical first step towards a more formal discussion on governance.

In the long run, a top down approach – possible under the umbrella of the United Nations – would be helpful in bringing together national maritime authorities and regional MSRs to develop a framework for improved information sharing and collaboration. Unfortunately, such an approach will remain aspirational until a credible organization steps up to the plate to take charge.

In order to build and maintain momentum from the bottom up, it is recommended that existing MSRs and individual stakeholders from across the

⁴³ MSR Manual and Enterprise proposal; p.p. A-35

⁴⁴ U.S. National Maritime Domain Awareness Plan, p.p. iv

⁴⁵ CoopP Final Report, Annex 6 WP 3 Final Report, p. 22

GMCOI continue to identify and implement practical solutions to address the most pressing challenges identified in this paper. Specific recommendations include:

Centres of Excellence (COEs):

The COEs should continue to support the consolidation, outreach and the expansion of existing initiatives and organizations. As a first step, the COEs should become more familiar with the breadth and depth of the GMCOI. Hence the COEs are in the process of identifying a number of key MSR stakeholders to either bring them together for a kick-off meeting or respectively to attend and support established GMCOI stakeholder events to foster MSA collaboration. Participation in regular ICAO/IMO Joint Working Group meetings or the ongoing IMO and WCO cooperative meetings in the fields of maritime security and global supply chain security could offer an entry point to engage with senior-level authorities.⁴⁶

Even though the COEs are working as international military centres affiliated with NATO, effort should continue to expand dialogue with non-military stakeholders of the GMCOI to foster cooperation across a wider maritime security cooperative. Of course, the COEs will continue to serve NATO as their main customer by further contributing to the current revision process of NATO MSA policy and doctrine.

The COEs are aware that at the same time additional promotion of the global governance and MSR collaboration has to be supported by public affairs initiatives. As measured by its importance and sensitivity, the maritime domain is clearly under-represented in the public perception. Maritime matters must take a prominent place in the media but also in on-going discussions on all levels. Consequently, academia and media representatives need to remain regular co-partners in COE activities.

⁴⁶ For more on this see IMO website:

<http://www.imo.org/MediaCentre/PressBriefings/Pages/28-icao-imo--wco-.aspx#.VGHx02PLct> (Access 11 November 2014).

European Union (EU) and NATO:

MSA is a perfect enabler of greater EU-NATO cooperation since both entities have a number of endorsed cooperation arrangements on security issues in place. Amongst others, the NATO-EU Declaration on ESDP⁴⁷ reiterated the principle of effective mutual consultation for the strategic partnership. Also, the very recently endorsed EU Maritime Security Strategy (EUMSS)⁴⁸ aims to secure the EU's maritime security interests by promoting effective and credible partnerships in the global domain.

It is recommended that progress meetings within NATO and the EU continue with a view towards creating MOUs to authorize and coordinate cross-organizational information exchange between NATO and the EU. This would meet the EUMSS's requirement to improve civil-military and cross-border cooperation and the interoperability of systems for maritime surveillance and maritime security, with a view to establishing comprehensive maritime awareness to improve early warning and facilitate timely response. Through practical arrangements such as MOUs and other agreements, the EU and NATO may overcome political, institutional and cultural setbacks to close cooperation and find other ways to bridge differences between members of the EU and NATO.

NATO is already on track in the area of MSA which became a Smart Defence initiative with the aim to drive NATO nations to develop a collective approach to resourcing NATO's maritime command and control information services. NATO is currently in the procurement phase of the new Multinational Maritime Information Services which will improve NATO's maritime command and control capabilities but also be capable of exchanging information with non-traditional partners. The EU is currently taking

⁴⁷ For more on this see: NATO-EU Declaration on European Security and Defence Policy.
<http://www.nato.int/docu/comm/2004/06-istanbul/press-kit/006.pdf> (Access 25 September 2014).

⁴⁸ Council of the European Union: European Union Maritime Security Strategy, p.3.

compatible steps with the development of CISE. Only through regular consultation and cooperation can the NATO Strategic Concept and the European Security Strategy complement one another without unnecessary duplication of efforts.

Another area for NATO-EU collaboration lies in the safeguarding of existing cooperative relationships established in maritime security operations, including the EU in Operation ATALANTA and FRONTEX, and NATO in Operations UNIFIED PROTECTOR, OCEAN SHIELD and ACTIVE ENDEAVOR. During these operations, the EU and NATO established numerous MOUs with partner countries and organizations regarding information sharing. Unfortunately, many of these agreements are at risk; as soon as the respective operation is terminated, most of the MOUs and partnership agreements will expire because of their temporary and operations-focused character.

The NATO-INTERPOL Cooperation Initiative stands out as an example of a win-win initiative. Agreed upon in December 2013 the initiative focuses on unclassified information exchange in relation to Operation OCEAN SHIELD. The initial pilot project revealed MSA synergies between the mandates of both organizations. Hence NATO and INTERPOL are now verifying a way to foster the cooperation for the benefit of both with the objective to secure longer term engagement. Both NATO and the EU should pursue the transformation of temporary mission-specific MOUs towards wider and more permanent agreements.

Maritime Security Regimes (MSRs):

The heart of MSA collaboration lies in connecting the various MSRs into a globally focused enterprise⁴⁹, where a single piece of disparate information collected in one MSR can be shared and result in the creation of a recognized maritime picture which is available and accessible to other stakeholders.

⁴⁹ An enterprise is a cooperative project undertaken, especially one that is important or difficult that requires boldness or energy. See: Maritime Security Regime Manual and Enterprise Proposal, p. ii

The establishment of information sharing MOUs, the exchange of Liaison Officers and embedded staff and the sharing of Critical Information Requirements will accelerate information sharing, maritime capacity building, and enduring partnerships built on mutual trust and shared interests.

International capacity-building efforts such as the EU Regional Maritime Capacity Building Mission in the Horn of Africa and the Western Indian Ocean (EUCAP Nestor)⁵⁰ as well as collaborative efforts in the Gulf of Guinea region could help set the conditions for the establishment of new MSRs and collaboration frameworks.⁵¹

United Nations (UN):

The UN and its specialized agencies and committees should play a key role in global maritime security governance and collaboration, logically through the International Maritime Organization (IMO). The IMO has already cut its teeth in a number of related areas including The Djibouti Code of Conduct, the International Maritime Security Trust Fund, initiatives to address piracy and armed robbery against ships, and IMO guidance and best management practices in a variety of areas. Furthermore, with amendments to the SOLAS⁵² and the ISPS Code⁵³, the IMO managed to put into effect a comprehensive mandatory security regime⁵⁴ for international shipping, with the aim to establish roles, responsibilities and an international framework for cooperation on MS matters.

The July 2013 meeting between the Secretaries General of the ICAO, the IMO and the World Customs Organization (WCO) in London could be seen

⁵⁰ For more information see:

http://www.eeas.europa.eu/csdp/missions-and-operations/eucap-nestor/documents/factsheet_eucap_nestor_en.pdf
(Access 23 September 2014).

⁵¹ United Nations (2011), Security Council Resolution 2018

⁵² Safety of Life at Sea Convention

⁵³ International Ship and Port Facility Security Code

⁵⁴ For more information see:

<http://www.imo.org/OurWork/Security/Pages/MaritimeSecurity.aspx> (Access 07 October 2014).

as the starting point for further cross-sectoral collaboration on the top level between the organizations in the fields of aviation, border and maritime security. The Secretaries General discussed supply chain security and related matters that cut across the mandates of the organization, stressing the requirement of coordinated approaches and connectivity between the GMCOI. The Secretaries-General have agreed to meet in a trilateral setting to review progress in this area.⁵⁵ Against this background, the IMO should play a leadership role in developing the necessary governance framework and supporting infrastructure necessary to create the habitual and persistent relationships between key stakeholders in the GMCOI, which is essential to enhancing MSA.

National-Level Initiatives:

The U.S. National Maritime Domain Awareness Plan for the National Strategy for Maritime Security, as well as many other national and Allied maritime security plans, policies and visions acknowledge the challenging task of achieving maritime security and recognize that information sharing and collaboration are essential to protecting national security, economic competitiveness and other vital interests. In this increasingly interdependent, interconnected, rapidly evolving and globalized world, successful national defence and security requires a flexible, multi-domain, whole of nation, multinational approach. Consequently, where appropriate, national-level direction and guidance regarding maritime security collaboration should be written and communicated to reflect this reality.

Private Sector Initiatives:

There are numerous private sector service providers who can supply a near-real time, unclassified multi-sensor Maritime Domain Awareness picture as an internet-based service accessible through any web-browser or as an enterprise-class system installed at customer locations. By collecting, fusing, analyzing and disseminating commercially available information from satellite

⁵⁵ For more on this, see IMO website:

<http://www.imo.org/MediaCentre/PressBriefings/Pages/28-icao-imo--wco-.aspx#.VGHx02PLct> (Access 11 November 2014).

or ground-based sensors and other data sources, commercial vendors provide an affordable entry point to start building local, national or regional MSA capabilities without the need to construct brick and mortar infrastructure or procure and maintain expensive Information Technology.

7.3 Conclusion

At the dawn of the new millennium, it comes as no surprise that complex issues such as security, economic competitiveness, innovation, wealth creation, social welfare, resource management, environmental protection, political stability and climate change are inextricably linked to the maritime domain and our knowledge of it. Yet in 2015, maritime security collaboration and information sharing between multinational, inter-agency and private sector stakeholders, which make up the Global Maritime Community of Interest, remains ad hoc.

This MSA study serves as a promotional paper and advisory guideline for interested parties to understand the problem, but more importantly to recommend concrete steps towards building habitual and persistent relationships between key stakeholders in the Global Maritime Community of Interest. Emphasis has been placed on the improvement of individual stakeholder MSA efforts as well as to advocate for improved governance and collaboration between the International Maritime Organization and the various Maritime Security Regimes which span the globe. Today, it is widely recognized that no single department or agency, let alone no single nation can achieve security in isolation. Multinational, interagency and public-private sector maritime security collaboration is indeed a 21st Century strategic imperative!

Annex A: Critical Information Requirements

The following questions could be considered when developing Critical Information Requirements:

- What level of awareness do I require to ensure timely warning of threats, risks and vulnerabilities in order to achieve a desirable outcome?
- What level of awareness do I require to ensure timely warning of market risks and opportunities in order to achieve competitive advantage?
- When and where does collection, fusion and analysis need to be conducted and with whom do I share information and collaborate in order to achieve decision-advantage and/or competitive advantage?
- What are the 2nd and 3rd order effects of my decisions and actions (or inaction)?

Critical Information Requirements could include organizationally critical facts, estimates or projections regarding:

- Natural or man-made occurrence,
- individual, entity, or action that has or indicates the potential to harm life, information, operations, the environment and/or property;
- Readiness and preparedness of one's own organization and the status of critical infrastructure and key resources to anticipate, respond to, mitigate, or recover from a significant natural or man-made occurrence;
- Long term recovery, economic impacts and business continuity.

The following is a notional example of a Maritime Security Critical Information Requirement:

No closer than _____ NM and no less than _____ hours sailing time from territorial waters, the following decision-makers _____ are to be informed of the following categories of Vessels of Interest _____, classified to a _____ level of confidence, and which are approaching an area defined by _____.

Annex B: References

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