PAVING THE WAY FOR REGIONAL MARITIME DOMAIN AWARENESS

INFORMATION FUSION CENTRE

Edited by
Christian Bueger and
Jane Chan

RSiS
S. RAJARATNAM
SCHOOL OF
INTERNATIONAL
STUDIES
Nanyang Technological University, Singapore

NANYANG
TECHNOLOGICAL
UNIVERSITY
SINGAPORE

PAVING THE WAY FOR REGIONAL MARITIME DOMAIN AWARENESS

INFORMATION FUSION CENTRE

Edited by

Christian Bueger and Jane Chan

S. Rajaratnam School of International Studies

TABLE OF CONTENTS

Introduction
Maritime Domain Awareness and the IFC

Christian Bueger and Jane Chan

Maritime Domain Awareness (hereafter: MDA) is increasingly identified as one of the backbones of successful maritime security provision. To govern the sea effectively and to enforce the law requires informed knowledge of what happens at sea. This is precisely what the term MDA embodies: a means of collecting information about movements at sea and maritime incidents, collating and fusing the information from different sources in order to develop a picture that can be shared with all agencies that deal with the sea, and also to produce actionable knowledge for law enforcement. It can be an important means to ensure rapid reaction to maritime events, such as incidents of armed robbery, piracy or accidents at sea. MDA is a concept and an ambition. It is not only the aspiration to gather a full picture of anything relevant to security at sea, but also to identify and predict potential threats to maritime commerce, maritime installations, the environment installation, and coastal populations. Maritime security is a transnational challenge and requires nations to work together. On a regional level, MDA allows countries to collaborate closely and develop a shared understanding of the regional maritime security issues that require a response and how to prioritise them.

In 2009, the government of Singapore launched a significant initiative to realise regional and global MDA. It inaugurated the Information Fusion Centre, known as the IFC. The IFC is a multi-national and multi-agency regional maritime information sharing and fusion centre. With an Area of Interest that stretches from the Maldives in the west to Papua New Guinea in the east, and 40 countries participating directly in its work, the IFC has become a standard of major global templates on how to organise regional MDA. This volume analyses this initiative in detail. To understand how MDA can be organised on a regional level, the contributors situate the IFC in a global and regional context of maritime security efforts, investigate its structure and working practice, and illuminate the hurdles and challenges of information sharing and successful MDA. Overall our aim is to understand

what can be learned from the IFC experience, and how it will be able to make an even stronger contribution in the region and beyond.

In this introduction we first review and discuss the promises and perils associated with MDA. Drawing on the insights of the following chapters we situate the IFC in a global and regional context. We then proceed with a short review of the history and structure of the IFC. We end in a discussion of the future prospect of the IFC as one of the core global maritime security knowledge providers.

THE PROMISES AND PERILS OF MDA

Enforcing the law at sea and preventing maritime crime has been recognised as major challenges throughout history. The vastness of the oceans and the lack of capabilities to monitor and patrol the seas allow maritime criminal activity to thrive. The modern law of the sea provides a basic framework for better maritime security by clarifying rights and responsibilities. While nations are fully in charge to protect their territorial seas, and hold the right to manage and oversee the resource exploitation within their 200 nautical miles (nm) Exclusive Economic Zone, every nation also has the responsibility to contribute to the governance of the high seas. The spatial framework that was established by the UN Convention of the Law of the Seas defines responsibilities, but it neither establishes duties nor gives maritime nations the capacity to effectively monitor ocean spaces beyond its territorial sea.

MDA is a response that aims at filling this capacity gap. MDA projects work towards establishing affordable solutions for improving the knowledge of activity at sea through remote technology, transnational information sharing, and collaboration in law enforcement. As discussed in greater detail in chapter two, MDA is driven by technological advancements, in particular in data collection, processing, and communication technology. But MDA is also a response to the increasing awareness for the transnational dimension of security at sea and the detrimental effects of maritime crime and insecurity for national economies.

Maritime security governance is a complex challenge both on a national and regional level. This complexity concerns firstly the multiplicity of actors involved in maritime law enforcement and regulation, including, but not limited to, maritime authorities, border, port and customs authorities, and

environmental regulators such as fishing authorities as well as enforcement agencies such as navies, coast guards, or marine police. Governmental agencies, departments, and ministries dealing with the sea often operate under different organisational structures, legal provisions, and mandates. This implies a significant jurisdictional complexity. Given the nature of maritime crime and how it operates across national jurisdictions, Koh in Chapter 3 drew examples from Southeast Asia to further argue that the complexity is exacerbated by regional geopolitical context.

While every nation organises its response to maritime security differently, MDA is usually one of the main vehicles and engine rooms that brings together national actors to work towards a common purpose. First, MDA is directed at improving communication between agencies. This is done through different meeting formats of agency representatives, but also a dedicated electronically enhanced communication infrastructure, using encrypted emails or different chat systems that enable text message communication in real time. The information that is shared through such channels can be jointly analysed and interpreted to form organised and harmonised responses.

Second, MDA works towards building a historical record of movements at sea, including transportation-related data as well as reported incidents in data bases. The basis for such records is reports from participating agencies, but also from publicly available sources and human intelligence. Record keeping has two related objectives. It allows for the identification of patterns and areas of concern, and hence for the setting of priorities for law enforcement. Knowing patterns can assist in more targeted and effective employment of seagoing capacity, but also in setting political priorities and driving planning and investments in enforcement capacity. Record keeping is also associated with the hope to automatically identify suspicious behaviour and even to predict criminal activity on the basis of machine learning and algorithms. These objectives are related to the paradigm shift associated with intelligence-led law enforcement.

Another important and closely related function of MDA arises in terms of its contribution to public knowledge more widely. The analysis produced in MDA can assist mariner's awareness of potential dangers at sea and hence enhance situational crime prevention by making opportunities for crime less appealing and riskier, for instance, through vessel hardening measures

or additional watchmen. The analytical products of MDA also strengthens the general public's understanding of the opportunities and dangers associated with the sea.

Since MDA advances new lines of communication, enables shared sense-making and interpretation, and acts as an everyday collaboration experience it is also seen as an important force in developing trust between agencies and nation states. Indeed, MDA structures are considered to be a prime enabler for cooperation at sea. In allowing countries to recognise the benefits of working together, spillovers in other domains which likewise would benefit from stronger cooperation can be expected.

MDA is hence the engine room for national and regional maritime security governance. Yet, without doubt, it is not without its challenges. As discussed in the chapters by Guilfoyle and Brewster, MDA requires new legal thinking and overcoming old stovepipes linked to organisational and national interests, the difficulties of establishing trust, and making optimal use of new technologies in a cost-effective manner. How does the IFC realise MDA? We now turn to an introduction to the IFC and its structure.

THE HISTORY AND STRUCTURE OF THE IFC

The IFC is an innovative centre that aims to develop a shared maritime security picture to enhance collective ability of understanding the maritime domain, and strengthen cooperation to ensure safety and security of shipping in the region and beyond. Established on 27 April 2009 (Figure 1), the IFC's modest mission was to collect and sense-make relevant white shipping and maritime information in its Area of Interest (AOI), and to provide actionable information on maritime security threats so as to cue enforcement agencies for operational responses. Located at the Changi Command & Control Centre (CC2C) at RSS Singapura, Changi Naval Base, the IFC is housed together with the Singapore Maritime Crisis Centre (SMCC) and the Multinational Operations and Exercise Centre (MOEC). Together, they serve as a platform to foster inter-operability and information sharing between like-minded maritime partners and agencies. The centre operates on a 24/7 basis, with an emergency response team manning the weekend and after hours.

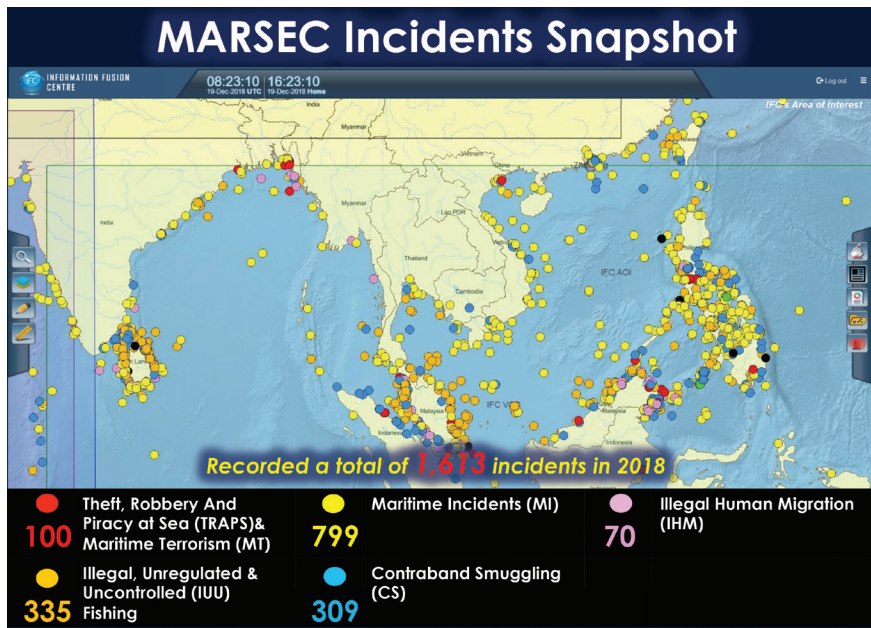The IFC focuses on the wide spectrum of maritime security issues. It

FIGURE 1
IFC Inauguration in 2009

Source: Republic of Singapore Navy

FIGURE 2
Incidents reported in IFC's Area of Interest in 2018

Source: Republic of Singapore Navy

addresses and records incidents in six broad categories. As shown in Figure 1 below [UKHO/IFC AOC Chart], these include: (i) Theft, Armed Robbery at Sea and Piracy, (ii) Maritime Terrorism, (iii) Illegal, Unreported and Unregulated (IUU) Fishing, (iv) Contraband and Weapons Smuggling, (v) Irregular Human Migration, and (vi) other Maritime Incidents. A typical snapshot of incidents reported in IFC AOI is illustrated in Figure 2.

THE IFC AND THE GLOBAL MDA NETWORK

There are three important pillars that prop up the IFC's structure. First, is the integrated Republic of Singapore Navy (RSN) – International Liaison Officers (ILOs) team structure. Second, its extensive global linkages. And third, the enabling technologies that is constantly being upgraded. Further, IFC invests a lot of time and effort in shipping engagement and capacity building activities. Supported by these key pillars, the IFC provides extensive operational value to its multitude of partners.

International Liaison Officers as part of the team

At the IFC, RSN personnel and ILOs work together as an integrated team. As shown in Figure 3 below, up to April 2019, the IFC has hosted 155 ILOs from 24 countries, and currently has 19 ILOs from 18 countries serving alongside RSN personnel. The ILOs brings to the fold tacit knowledge of unique or specific characteristics from within their respective national and regional domain, which increases IFC resources and sense-making capabilities. The ILOs also act as conduits between the IFC and their respective national Operation Centres (OPCENS) and parent agencies, which is an important avenue to verify and value-add existing information, and to facilitate information sharing in a timely and efficient manner.

While conventionally the ILOs are from the navies of their respective countries, in 2018 the Philippines was the first country to send a coast guard officer along with a naval officer to the IFC. Other regional law enforcement agencies have expressed interest to post an ILO at the IFC, and the shipping industry is currently also exploring such an option. This demonstrates that the IFC is beyond a navy-to-navy collaboration. In fact, it is a much wider regional MDA arrangement in which all law enforcement agencies across the civil-military spectrum engage.

FIGURE 3
ILOs at IFC as of April 2019

Source: Republic of Singapore Navy

The ILOs are clustered based on their national priorities and areas of expertise according to the six categories of maritime security issues. Their broad tasks include daily briefs, weekly updates, monthly analyses and summaries, quarterly reports, engagement, and capacity building activities. When an incident is reported to the IFC, as part of the IFC 24/7 incident response team, the relevant ILOs will be activated to contact their respective OPCENS to share information or to seek verification, and thereafter provide assessments and recommend operational responses.

Extensive global linkages

In addition to the ILO's, the IFC collaborates with a wider international network of countries. Figure 4 shows how over the years, the IFC has established 97 formal linkages in 40 countries in the form of information sharing agreements and other arrangements for cooperation. It is also one of the core participants of the Trans-Regional Maritime Network (T-RMN). The network brings together the IFC's Open & Analysed Shipping Infor-

mation System (OASIS), the Virtual Regional Maritime Traffic Centre for the Mediterranean operated by the Italian navy, Brazil's Maritime Traffic Information System, as well as the most recent addition, India's Maritime Surveillance Information System. The network aims at enhancing global maritime information-sharing and cooperation.

FIGURE 4
IFC's global linkages

Source: Republic of Singapore Navy

Enabling technologies

The IFC's first information sharing portal was based on a kit of software titled the Open and Analysed Shipping Information System (OASIS). The system contains a compilation of white shipping information based on Automatic Identification System (AIS), the Long Range Identification and Tracking System (LRIT), and maritime security data from national and international partners, commercial entities, and other open source avenues. OASIS was developed by the Comprehensive Maritime Awareness Team from the Defence Science and Technology Agency (DSTA) of the Singapore government. OASIS draws on an open interface architecture that can be

customised to different needs. Information fused into OASIS will then be ingested by an analytical tool called Sense-Making, Analysis, and Research Tool (SMART). SMART allows the user to define rules and enables the piecing together of vague or partial information that spans organisational, national, and time boundaries. SMART 'connects the dots' between real-time and archived data, to identify emerging trends and provide early warning to cue operational responses.

Like other MDA software the, OASIS/SMART is fully operational, but requires continuous improvement. To improve upon the existing software, the IFC Real-Time Information-Sharing System (IRIS) is an upgraded platform with a comprehensive data repertoire built on OASIS and SMART. It is purpose-built for maritime security collaboration and encompasses a global Recognised Maritime Picture (RMP), an incident indication feature on a common RMP, an enhanced information-sharing suite equipped with message chat, file/picture/video exchange, and file repository functions for the ease of sharing and extracting relevant information. There will also be a Voice over Internet Protocol (VoIP) capability for users to talk to each other, regardless of being ashore or at sea. In essence, IRIS can provide an overview of incident locations, shipping traffic, and Areas of Interest, all in a single snapshot. IRIS is mobile friendly and will be accessible on any device connected to the internet.

IRIS on IFC Watch Floor

Source: Republic of Singapore Navy

ENGAGEMENT WITH THE SHIPPING COMMUNITY

Over the past ten years, the IFC has developed close working relations with the shipping community. To promote maritime security awareness and to galvanise action from the shipping community, the IFC instituted the Voluntary Community Reporting (VCR) scheme. Ships are encouraged to report their position to the IFC, and in return they will receive localised situational updates. The IFC also organises the quarterly Shared Awareness Meetings (SAM) which brings together local and regional maritime security communities to discuss current challenges, potential measures, and sharing of best practices. A typical SAM will provide situation updates on regional and international hotspots, plus presentations from subject matter experts on maritime security issues. It usually runs for half a day, and is designed as a platform for industry and enforcement agencies to hear each other's perspectives and exchange ideas. IFC also generates various output including the daily incidents and press summary, weekly reports, monthly maps, and spot commentaries, which is widely shared with the shipping community.

IFC has established over 350 shipping linkages, including ship owners, ship managers, charterers, oil majors, and major shipping associations, such as Singapore Shipping Association (SSA), Asian Ship-owners Association (ASA), BIMCO, INTERCARGO, and INTERTANKO. As IFC continues to deepen engagement with the shipping community through established platforms such as SAM and targeted visits, IFC is also exploring the possibility of inducting Merchant Navy Liaison Officers, as representatives from the shipping community to develop closer working relations.

CAPACITY BUILDING EFFORTS

As the first of its kind in the region, the IFC has come a long way to put into practice the concept of collaborative information sharing and sense-making. One of the ways to extend its expertise to partners and friendly countries is through various training programmes and information sharing exercises, such as the Maritime Information Sharing Exercise (MARISX), ASEAN Maritime Information Sharing Exercise (AMSISX, and the Malacca Straits Patrol (MSP) Exercise. In collaboration with the S. Rajaratnam School of International Studies (RSIS), IFC also conducts the annual Regional MARSEC Practitioner Programme (RMPP). RMPP brings together mid-

ranking naval and maritime enforcement practitioners from around the world. Past participants saw RMPP as a valuable additional education in maritime security MARSEC knowledge enabler, and a significant networking opportunity.

Since its first iteration in May 2009, MARISX is held bi-annually and is IFC's flagship exercise. It is also one of the largest information sharing exercise in the world. MARISX 2017 saw participation from more than 35 navies, and law enforcement agencies from 33 countries. The IFC also participates in other multilateral exercises such as the US-led Southeast Asia Cooperation and Training (SEACAT), Exercise Bell Buoy, and the International Maritime Exercise (IMEX).

The IFC serves as the Permanent Secretariat for the ASEAN Navy Chief Meetings (ANCM) since 2013. The ANCM is an annual meeting of the Navy Chiefs from the 10 ASEAN countries and their representatives to discuss maritime issues and multilateral naval cooperation. In October 2018, the IFC participated in the inaugural ASEAN-China Maritime Exercise, where a working prototype of IRIS was successfully deployed for the first time.

FIGURE 5
Examples of capacity building efforts

Source: Republic of Singapore Navy

OPERATIONAL SUCCESS

IFC and its partners have achieved many operational successes since its inception. Two examples showcase how MDA can provide the platform for cooperation within regions and between them.

One of the most prominent of these success stories involved the hijacking of *Hai Soon 12*. On 8 May 2016, Hai Soon 12 was reported missing in the Karimata Straits, Indonesia. The vessel was carrying 21 crew members and US$3 million worth of oil cargo. The vessel's AIS was switched off and the crew were not contactable via email and VHF radio, and all mobile phones were switched off. Having a good understanding of how the shipping industry functions, the IFC believed that the insurer would have required the owner of the cargo to place a secondary tracker onboard for cargo of that value. IFC was able to contact the cargo owner who provided the position of the ship via the secondary tracker. The Indonesia ILO shared this information and followed up with regular positional updates with the Indonesia Navy. Upon receiving information on the location of Hai Soon 12, the Indonesian Navy deployed two of their assets and HAI SOON 12 was intercepted within eight hours in the Java Sea. All 21 crew members, the vessel and its cargo were safely recovered. Investigation by the Indonesian authority revealed that the perpetrators planned to sail the vessel off Papua to sell the cargo in the black market.

The next success story features the IFC working with partnering a similar outfit in a different region. The *STS-50* is a fishing vessel wanted by Interpol (Purple Notice) and many countries for illegal fishing. The Regional Maritime Information Fusion Centre (RMIFC) Madagascar was tracking this vessel and as the vessel was observed to be headed to Southeast Asia, the France ILO shared information on the ship's position with the IFC. The IFC started monitoring the movement of STS 50 on a daily basis. As it was nearing Indonesian waters, the Indonesia ILO provided information and regular positional updates to the Indonesian Navy's Western Fleet Command. The Indonesian Navy successfully captured the STS-50 on 6 April 2018, east of Sabang Weh Island within Indonesia's territorial water. Thirty crew members were found onboard and detained by the authorities, including 20 Indonesians, 8 Russians, and 2 Ukranians. Investigations subsequently revealed that the Indonesians onboard had their passports removed and were working without pay (possible slavery).

THE IFC: AN OUTLOOK FOR THE NEXT DECADE

Fully cognisant of regional realities—where willingness and the ability to share hardly comes easy—the IFC in many ways is trying to change the conventional mindset of 'need to share' towards a 'responsibility to share'. Brewster discussed this issue of regional mindset in more detail in Chapter 6. Recognised as a regional information sharing hub, the IFC will need to continue to reinvent itself to stay relevant and be ahead of the ever-changing maritime environment. Similar outfits to the IFC are being established worldwide. Some may strive to distinguish itself from the rest, as illustrated in Chapter 4. Others may subsequently link up with the IFC. A few were set up with the help of the IFC, and the Peruvian experience is iterated in Chapter 5.

The IFC will have an important role in steering and advancing this global architecture of MDA centers through capacity building but also everyday cooperation. The IFC will become, as Till notes in his outlook for the future (Chapter 9) an ever more important tool in the transnational response to crime at sea. In a maritime world that might be increasingly characterised by rivalry MDA centers like– the IFC arestands as an organic trust and confidence building measure, and they also providewith continued capacity for independent judgement in a post-factual world.