Sea Power Series
3

PROTECTING THE ABILITY TO TRADE IN THE INDIAN OCEAN MARITIME ECONOMY

EDITED BY ANDREW FORBES

Sea Power Centre - Australia

PROTECTING THE ABILITY TO TRADE IN THE INDIAN OCEAN MARITIME ECONOMY

PROCEEDINGS OF THE INDIAN OCEAN NAVAL SYMPOSIUM SEMINAR 2014

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SEA POWER CENTRE - AUSTRALIA

The Sea Power Centre - Australia was established to undertake activities to promote the study, discussion and awareness of maritime issues and strategy within the Royal Australian Navy, the Department of Defence and civil communities at large. Its mission is:

- to promote understanding of sea power and its application to the security of Australia's national interests
- to manage the development of RAN doctrine and facilitate its incorporation into ADF joint doctrine
- to contribute to regional engagement
- contribute to the development of maritime strategic concepts and strategic and operational level doctrine, and facilitate informed force structure decisions
- to preserve, develop, and promote Australian naval history.

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Foreword

The Indian Ocean is a region of great diversity, great potential and great importance. It is significant because of the global and intra-regional trade which passes through it and for the value of its marine resources. It is important not just for the nations which face its waters, but for all nations around the world which depend on the global maritime trading system for which the Indian Ocean is such a crucial part. Notwithstanding its importance, the security architecture of the Indian Ocean region has received far less attention than most other parts of the world and certainly far less than it warrants. As a result, the Indian Ocean Naval Symposium (IONS), as one of the few pieces of regional security architecture, has a vital role in promoting good order at sea.

Maritime security is an enduring, multilateral task, which defies easy geographic definition. It is by necessity a collaborative activity, as no nation has the capacity to provide ubiquitous protection for all of its maritime interests. As such, the focus of the IONS Seminar held in Perth this year was *Protecting the Ability to Trade in the Indian Ocean Maritime Economy*. To protect trade requires multilateral cooperation and the habits of cooperation which enable the security of the Indian Ocean precinct of the great global commons. This protection starts with mutual understanding, which was the objective of the Seminar and, judging by the quality and breadth of the papers in this volume, I think IONS has made good progress.

As the current Chair of IONS, I am determined the Royal Australian Navy will do everything it can to build on the work of our predecessors to make the IONS a vibrant and active group which advances the interests of all members. I would like to offer my sincere and earnest thanks to the authors of the papers in this book and to the Chiefs of the region's navies, coastguards and marine police forces who have guided and supported their contributions. I encourage all with an interest in the security of the Indian Ocean region to read this book and improve their understanding of the variety of maritime interests and resources in our region.

RJ Griggs, AO, CSC, RAN
Chief of Navy, Australia
June 2014

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CONTENTS

Abbreviations

ADMM-Plus	ASEAN Defence Ministers Meeting-Plus
ADSOM	ASEAN Defence Senior Officials Meeting
Aframax	oil tanker <120,000 DWT
AMSA	Australian Maritime Safety Authority
APEC	Asia Pacific Economic Cooperation
ARF	ASEAN Regional Forum
ASEAN	Association of Southeast Asian Nations
bcf	billion cubic feet
bcm	billion cubic metres
BIMCO	Baltic and International Maritime Council
BMP	Best Management Practices
Capesize	cargo vessel >150,000 DWT
CCSBT	Convention on the Conservation of Southern Blue-fin Tuna
EAS	East Asia Summit
E, D & P	Exploration, Development and Production
EIA	Energy Information Agency (US)
EUNAVFOR	European Union Naval Force
EWG	Expert Working Group
FAO	United Nations Food and Agriculture Organization
GDP	Gross Domestic Product
Handysize	cargo carrier 20,000-28,000 DWT
HADR	Humanitarian Assistance and Disaster Relief
IFC	Information Fusion Centre

IMO	International Maritime Organization
IOMAC	Indian Ocean Maritime Affairs Cooperation
IONS	Indian Ocean Naval Symposium
IORA	Indian Ocean Rim Association
IOTC	Indian Ocean Tuna Commission
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
ISPS	International Ship and Port Facility Security Code
IUU	Illegal, Unregulated and Unreported (fishing)
LNG	liquefied natural gas
LOSC	*United Nations Convention on the Law of the Sea 1982*
LPG	liquefied petroleum gas
MoU	memorandum of understanding
MSC-HOA	Maritime Security Centre - Horn of Africa
NATO	North Atlantic Treaty Organization
OECD	Organisation for Economic Cooperation and Development
OPEC	Organization of the Petroleum Exporting Countries
ReCAAP	Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia
SAR	Search and Rescue
SHADE	Shared Awareness and Deconfliction
SLOC	Sea Lines of Communication
SOLAS	*International Convention for the Safety of Life at Sea 1974*
Seuzmax	liquid tanker average 160,000 DWT

SUA	*Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation 1988*
Supramax	cargo carrier of 50,000-60,000 DWT
tcf	trillion cubic feet
TEU	twenty-foot equivalent unit
UAE	United Arab Emirates
UAV	Unmanned Aerial Vehicles
UKMTO	United Kingdom Maritime Trade Operations
ULCC	Ultra Large Crude Carrier
ULCV	Ultra Large Container Vessel
UNCLOS	United Nations Conference on the Law of the Sea
UNDOC	United Nations Office of Drugs and Crime
VLCC	Very Large Crude Carrier
WMD	Weapons of Mass Destruction
WPNS	Western Pacific Naval Symposium

Keynote Address

Michaelia Cash

Welcome to Perth, Australia's gateway to the Indian Ocean.

I want to welcome you here today on behalf of the Australian government and the Minister for Defence, Senator David Johnston, whom I am representing today. As a great supporter of both the Royal Australian Navy and the Indian Ocean Naval Symposium construct, he really wishes he was the one delivering this speech but he has pressing parliamentary and government business in Canberra which could not be avoided.

As a proud Western Australian, I can think of no better a place for Australia to begin its chairmanship of the Indian Ocean Naval Symposium. The founder of modern Perth was a naval officer, Captain James Stirling, who was married to a daughter of one of the directors of the British East India Company, so the nexus between navies, maritime forces and global maritime trade has always been at the heart of this city.

Here in Western Australia we have been fortunate enough to have great demand for the minerals and resources we produce. There has been huge effort to develop these resources, from the oil and gas of the Northwest Shelf, to the iron ore of the Pilbara, to the wheat fields which surround Perth. Most of the production of Western Australia is exported to the world via the Indian Ocean. And I know that this pattern is reflected elsewhere, with manganese, coal and wheat from South Africa, iron ore and chemicals from India and petroleum products from the Middle East. It should therefore come as no surprise to this audience for me to suggest that the Indian Ocean region is an area of growing strategic and economic importance, to Australia, to the region and to the world.

I would like to focus specifically on the importance of trade and the sea lines of communication that are the arteries of the global economy within the context of the Indian Ocean region. One of the things which stands out most strongly in this seaborne trade is the so called 'Iron Highway' linking the Bab el-Mandeb, the Strait of Hormuz and the Malacca Strait. Roughly three-quarters of the world's oil and about half of all containerised trade use the Iron Highway, along with some of the most significant iron ore and natural gas trades. These trade flows are vital to the national economies of all of the countries represented here, as well as to our

major trading partners, China, Japan, Republic of Korea, and the United States to name just four.

But the Iron Highway is not just an express route from Europe and the Middle East to North Asia and the Americas. Demand from within the Indian Ocean states themselves is also a major factor of the Iron Highway, meaning it has many 'on ramps'. As just one example, India's projected economic growth over coming decades alone will change the Indo-Pacific region's energy and trade balance and reinforce this region's position as a destination in its own right as well as a transit point for regional trade flows. The ability to trade is important to all the nations of the Indian Ocean. The importance of these trade flows cannot be underestimated. Nor can the shared interests of all Indo-Pacific states in ensuring that these flows are secure, thus delivering economic benefit for all. As we know, the costs of a breakdown of security could and would reverberate across the Indo-Pacific region.

That says to me that arrangements such as this Indian Ocean Naval Symposium are key to the region's future. We have got very important work to do here and that should not go unstated.

If the trends we have observed over the last decade continue, and I have every reason to think they will, then it seems to me that the ability, within and from the Indian Ocean, to access the global maritime trading system has become one of the most important security challenges for all of the nations in the Indian Ocean region. Any disruption to the global maritime trading system is thus a matter of critical importance to governments across this region. The role that navies, coastguards and marine police around our region perform in securing our access to, and the ongoing security of, the global maritime trading system, is thus fundamental to each nation's security.

This is, of course, where you all - chiefs of navy, heads of coastguards and marine police, and your organisations - have such an important role to play. Quite simply, you are the people who can and do preserve good order at sea. Without good order at sea, the ability to trade is compromised - it becomes less reliable and more expensive. If that happens, the economic potential and the long term stability and security for all our nations are diminished. Today, and into the future, the region faces many challenges. The most broadly publicised of these challenges is, of course, piracy. But there are many others, including arms trafficking, proliferation, terrorism, extremism, fisheries exploitation, environmental challenges and many others.

I am pleased to note that much good work has been done collectively to address some of these challenges. The work of Combined Maritime Forces, the multinational naval partnership is one great example of cooperation in the Indian Ocean. Covering the Persian Gulf, Red Sea, Gulf of Aden, Gulf of Oman and parts of

the Indian Ocean, it has delivered great success in its efforts to defeat terrorism, prevent piracy, encourage regional cooperation, and promotes a safe maritime environment.

Australia currently has the frigate HMAS *Darwin* deployed to the region - our 57th individual ship deployment to the Middle East since 1990. Australia and Pakistan have the honour to be the current commanders of Combined Task Forces 150 and 151 respectively. And I know there are many nations here which also contribute to the work of Combined Maritime Forces: France, Malaysia, Pakistan, Seychelles, Thailand, the United Kingdom, the United States, and Yemen. And there are many more here that do similar work through either the EU or NATO constructs or contribute independently.

Turning to another exemplar of the security challenges that this region faces, it may surprise you all to note that the eastern Indian Ocean alone is home to about 45 per cent of the world's fishers. So when we look at regional fisheries, even without considering industrial deep water fishing, we are looking at an issue of fundamental importance to hundreds of millions of people. While much of this obviously occurs within national waters and exclusive economic zones, fish are not confined by lines drawn on charts and maritime borders are porous, so the food-security issue is underpinned by the cooperative enterprise of good order at sea.

But good order at sea does not simply happen by itself. It takes concerted, consistent and cooperative efforts to ensure the freedom of the seas for those who go about their lawful business and to suppress and disrupt those who would use the sea for purposes which are against our common interests. It will be important for the future security and prosperity of the nations you represent, that we be honest about the state of our regional security architecture. Whilst there have been some significant developments in recent years, not least of all the maturation of this Indian Ocean Naval Symposium and the evolution of the parallel Indian Ocean Rim Association, the security architecture of the Indian Ocean region is not as mature as that of other regions and we need to work on this.

I think there is a need to better develop this security architecture and in this context I think that you in this room have a key role to play.

There are three key areas that I would urge you to look at during your deliberations over the next few days, and going forward. These are your business practices; the structured manner in which you as a group look at addressing regional challenges; and, how we can work together collaboratively to build regional security capacity through practical action. I will not go into the detail of these challenges, because I know that Admiral Griggs plans to do so. But I truly believe

that through efforts in these areas we can best advance the security architecture of our region. Through forums such as this, I think we could see that the region's seas are not something to keep us apart; they are the place where we find new needs and new areas of cooperation.

I do not expect that it will be easy but I do think the effort is worthwhile and strongly believe it will be in the best interests of all our nations to make the effort. The habits of cooperation that are developed from working together are habits that can have positive benefits far beyond their immediate aims. Though our region has been and will likely always remain a diverse one, I think our mutual interests in good order at sea, and our mutual interests in protecting our collective ability to trade, are powerful forces which bring us together. Your presence here, your continued support of the Indian Ocean Naval Symposium is to me a positive sign and I thank you for that. It is an honour and a great responsibility for the Royal Australian Navy to be the Chair of Indian Ocean Naval Symposium – a responsibility I know that is taken very seriously. I welcome the contribution everyone will make to this Symposium.

Once again, on behalf of the Australian government, I have great pleasure in welcoming you to Australia and, as a Western Australian, I have great pleasure in welcoming you to our state capital Perth. I hope you enjoy your visit and have a very productive Symposium.

Opening Remarks

Ray Griggs

It is my great honour to welcome you to Australia and to Perth for the 2014 Indian Ocean Naval Symposium (IONS).

The Royal Australian Navy has operated across the expanse of the Indian Ocean since its foundation, from the Persian Gulf to the deep south of the Indian Ocean, and this ocean of course played an important part in the earliest European discovery of our Great Southern Land. We have strongly supported IONS since its inception and as such it is particular honour for Australia to host this event.

I would like to pay tribute to the South African Navy and Vice Admiral Mudimu for the stewardship of IONS over the last two years. As our most recent Chairman, he has played an important part in ensuring that we are able to establish what I believe will be one of the most significant pieces of security architecture in our region.

Rear Admiral Pillay, thank you for being here representing Vice Admiral Mudimu; I know he is busy handing over to Vice Admiral Hlongwane and all of us here understand the demands of that process. As the incoming Chairman, I would be grateful if you would pass on my deep and most sincere thanks on behalf of all the members and observers of IONS, to the South African Navy and its leaders for their stewardship. On behalf of those here I would like to express our best wishes to Vice Admiral Mudimu for whatever lies ahead in life after being Chief and also our best wishes to Vice Admiral Hlongwane for what also lies ahead of him. I think the combined efforts of the three previous chairs, India, United Arab Emirates and South Africa have got us to a crucial point in the evolution of IONS.

If there was ever an incident which shows us, the mariners of the Indian Ocean, of the need for this symposium and of the need to work collaboratively, it is the search for the tragic loss of Malaysian Airlines flight MH370. I offer my condolences to the families of those passengers and crew who have been lost. It remains a deeply troubling and sad time for them. The scale and breadth of the search operation has been unprecedented with search activities in the South China Sea, the Gulf of Thailand and throughout the Indian Ocean from the Bay of Bengal to the current focus some 1500nm south west of us here in Perth. If there are any significant developments in the search during the seminar I will ensure that we bring them to your attention.

This combined search effort has shown the importance of collaboration and cooperation. It has underscored the importance of developing 'habits of cooperation'. If we have the habit, the mechanics of cooperation become easier,

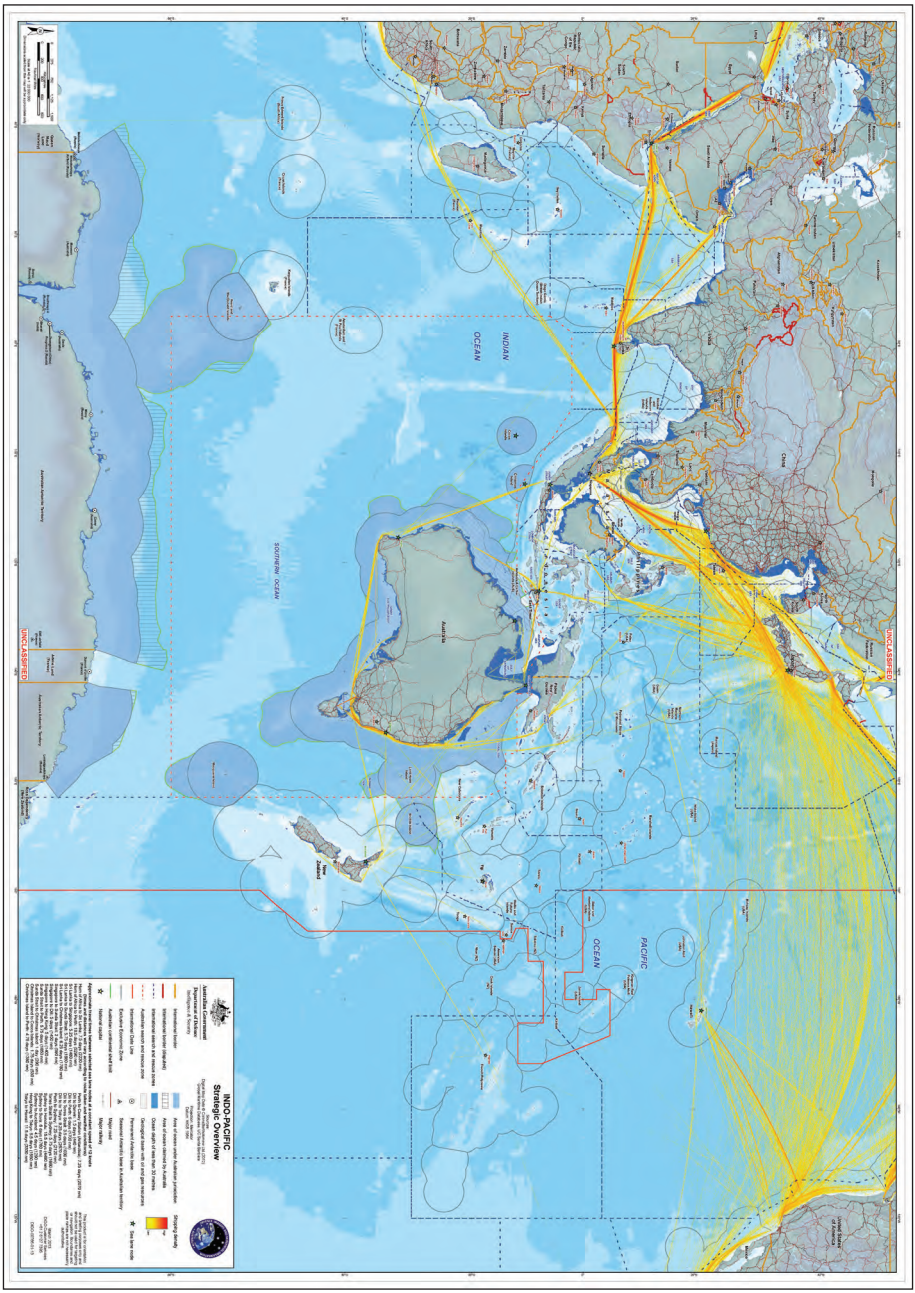

Figure 1: Indo-Pacific strategic overview

whether it be for this or for major international responses to natural disasters as we saw in The Philippines last year.

At the core of these types of international responses are relationships, relationships at the political level and for us relationships between our military forces. Events such as IONS are crucial for the development of these relationships. I hope we can further develop relationships between navies and each other over the next few days so we can continue the important work we do.

At the heart of the important work we do at sea is to protect our collective ability to trade. When you boil down most of our maritime security threats, it is their potential to disrupt our trade and our societies that stands out. The scale of the collective international response to piracy off Somalia is, at the end of the day, because of the fundamental importance of the trade route from the Bab el-Mandeb to the Malacca Strait, the so called Iron Highway.

In thinking about what we are trying to achieve with IONS, and what theme to give to this symposium I was searching for something that was of equal importance to all member states and those who have a significant interest in this region. Hence the seminar theme of *Protecting the Ability to Trade in the Indian Ocean Maritime Economy*. I am pleased with the response to this theme as I am with the quality of the speakers we have been able to gather for the next two days. Of course without good order at sea we cannot have a safe and efficiently functioning global maritime trading system. I suspect the importance of good order at sea and our collective role in maintaining it will be a recurring theme.

On Friday we will have the conclave of chiefs. For member states the conclave is an important activity as it sets out the work of IONS for the next two years. As I mentioned we are now at a crucial point in the development of IONS following much hard work. I am determined to ensure that Australia lives up to the responsibility of becoming the chair for the next two years.

At the conclave this year I have two aims. First is to gain agreement to the Charter of Business. This is something that is critical to us moving forward and further developing the structure of IONS. I think the very good work done in the last two years will enable us to achieve this important milestone. An important by product of the Charter of Business will be the ability to involve observer countries more actively; I think this is something that is very important noting the valuable contribution they make in the Western Pacific Naval Symposium (WPNS) for example.

The second aim is for us to continue the maturation process of IONS by using as much as we can from like - institutions such as the WPNS and the ADMM-Plus Expert Working Group (EWG) construct and I am pleased we will hear from Madame Suriani from Malaysia on the latter group.

One way we are proposing to accelerate that maturation is that we consider the introduction of a system of IONS working groups. This is something some have been able to see in operation in the context of the ADMM-Plus, where in just a couple of short years, a series of working groups have conducted tabletop and even field exercises on issues which are of mutual benefit.

The working group concept is based on the premise that all IONS members, whether their nations are represented by national navies, coastguards or marine police, have skills, strengths and knowledge which can be contributed; and that through participation all nations will benefit from the activities of the working groups. You will see from the papers that we have suggested working groups to cover humanitarian assistance and disaster relief, counter-piracy, information sharing and interoperability, counter-smuggling, and the environment.

I am a firm believer in the great understanding which exists between mariners, who have seen the sea, experienced its vast distances and its enormous power. We, as mariners, know better than most that it is beyond the ability of any one nation to control, yet we also know how important it is that we maintain security at sea. Institutions such as IONS are made up of many, many relationships. They develop over time and each one takes an act of conscious will, at both the national and the personal level. What we undertake over the next few days will add to the stock of goodwill which exists between the mariners of the Indian Ocean.

One final aspect which I would like to mention at this stage is the IONS Essay Competition. I strongly believe these essay competitions serve two great purposes. They encourage the entrants to learn more about their profession and the environment on which we depend so much. Even more importantly, they are a vehicle for a much wider number of people to learn more about the nations and interests of others around our region. This education process is an important part of creating the environment which supports our future security and prosperity by encouraging mutual understanding. It is in a way, a means of continuing the relationship building which we are undertaking here. I seek your support to publicise and encourage members of your service to enter the competition - it would be a great achievement for IONS of there were to be an entry from every single member.

Colleagues, ladies and gentlemen, thank you for being here in Perth and I look forward to a very fruitful few days and a productive couple of years ahead as we take IONS forward together.

An Overview of Indian Ocean Security Architecture

Michael L'Estrange

I very much appreciate the invitation that has been extended to me today to contribute some perspectives on the evolving security architecture of the Indian Ocean. The adequacy of any region's security architecture is inextricably linked to its security outlook. In that context, my contribution today is underpinned by four key themes:

- First, that the Indian Ocean's unique strategic circumstances will make it increasingly important in economic and geopolitical terms for countries within the region as well as beyond it.
- Second, that the need for effective security architectures in the Indian Ocean region has never been more necessary at a time when existing arrangements find it increasingly difficult to address proliferating regional challenges effectively.
- Third, that the new dimensions of security dialogue and cooperation on Indian Ocean security issues which are called for need to be underpinned by neither alarmism nor complacency, to be focused on practical outcomes and to reflect the fact that many of the old strategic demarcations between the Indian and Pacific oceans are breaking down as a new Indo-Pacific security framework gains ascendancy.
- And fourth, that as the limits of comprehensive multilateralism become more accentuated, the complementary role of bilateral and plurilateral cooperation (such as IONS) in support of broadly shared objectives in the Indian Ocean will become more relevant and important.

The Indian Ocean Security Outlook

On the first of these themes, the security outlook for the Indian Ocean region is increasingly important for global stability and prosperity because it encompasses a vital and expanding intersection of geostrategic rivalries, economic ambitions, resource competition, environmental management, development challenges and demographic change. Its geostrategic importance is accentuated by the fact that, as the most intensively used and strategically important trade highway in the world, it is an intensifying focal point of tensions between the maritime interests

asserted by some states and the rights accorded to them under international law, particularly the *United Nations Convention on the Law of the Sea 1982*. What makes the strategic outlook for the Indian Ocean region even more important, and more complex, is the fact that it reflects an aggregation of national ambitions, regional interests, sub-regional priorities and non-state actor involvement.

A broad architecture of security cooperation among Indian Ocean and non-regional states needs to be responsive to these growing complexities and this rising geostrategic importance. In doing so, it needs to accommodate legacies from the region's past and respond creatively to its contemporary and future challenges.

The legacies from the past include the longstanding rivalries among particular Indian Ocean states, the historical lack of strategic convergence and sense of common identity in the region, the disparities in economic development, and the absence of established structures for multilateral security diplomacy including any corollary to the hub and spokes alliance system that has been a feature of the Asia-Pacific region for over half a century.

These historical legacies co-exist with the Indian Ocean's contemporary and future strategic challenges. Those challenges encompass the management of strategic competition among the major powers, particularly China, India and the United States. They include the increasing reliance of the rapidly growing economies of the Indo-Pacific region on maritime imports of energy supplies from the Persian Gulf through Indian Ocean sea lanes and chokepoints. They include the challenges inherent in new technologies in and under the Indian Ocean that are likely to facilitate access to its energy resources. There are also challenges of piracy, illicit trafficking and support for terrorism. And there are other challenges as well that relate more particularly to the Indian Ocean region's smaller and less developed states - challenges of governance, development, access to resources (especially food and water), and unresolved maritime jurisdictional boundaries focused on their overlapping exclusive economic zones.

The range of these legacies from the Indian Ocean region's past, and the contemporary and future challenges it faces, means that there is no basis for complacency about its security outlook. That is particularly the case given that trade flows in the Indian Ocean will continue to increase significantly, competition for scarce resources will intensify, naval activity will grow and risks will intensify. New dimensions of security dialogue and cooperation on Indian Ocean issues are clearly necessary, but a sense of alarmism and strategic overreaction is not. The geographic scale of the Indian Ocean and the diversity of its littoral states do not make it amenable to strategic control by a single dominant power. Access to open sea lanes and freedom of navigation through chokepoints certainly cannot be taken for granted but nor are they under imminent threat from hostile power projection capabilities or confrontational rivalry among the major powers.

Contours of Indian Ocean Security Architecture

These complex realities of the security outlook in the Indian Ocean have fundamentally important implications for its security architecture. The region is simply too vast in its geography, too diverse in the economic needs and priorities of its constituent states, and too disparate in its strategic outlooks to accommodate a 'one size fits all' approach to regional security architecture. The Indian Ocean region's security outlook demands responses that are practical, adaptive and multi-layered. It needs to reflect the realities of major power cooperation and competition, alliance frameworks, sub-regional groupings and more plurilateral arrangements.

Strategic competition, particularly among major powers such as the United States, China and India is inevitable, but confrontation among them is not. Such competition needs to be balanced by strategic cooperation to minimise strategic misunderstanding and misinformation, and to strengthen habits of cooperation on specific issues.

In addition to major power relations, aspects of Indian Ocean security are also critically affected by alliance and strategic partnerships involving regional and non-regional states. Some of those partnerships are longstanding and established; others are emerging and evolving. Some are bilateral; others are more broadly-based. But all such partnerships constitute only a dimension of regional security architecture, and not the sum total of it.

On a range of issues - such as economic development, piracy, terrorism and illicit trafficking - more plurilateral mechanisms, including coalitions of the relevant that involve major as well as minor powers, can offer the most productive way forward. Such coalitions of interest can embrace strategic partners as well as competitors; and they can be formal or informal. They can meet immediate needs. But they do not constitute a security architecture in their own right.

Sub-regional structures in the Indian Ocean region also play niche roles in support of regional development and security. This is reflected in the work of the Southern African Development Community, the East African Community, the Indian Ocean Commission, the Arab League, the Organisation of the Islamic Conference, the Gulf Cooperation Council, the South Asian Association for Regional Cooperation, ASEAN, the ASEAN Regional Forum (ARF), the East Asia Summit (EAS), the Asia Pacific Economic Cooperation forum (APEC), and others. These organisations, all involving Indian Ocean states, are focused on issues that can affect state and human security. But their priorities and membership reflect largely sub-regional priorities focused on southern Africa, the Persian Gulf, South Asia and Southeast Asia.

There are some plurilateral initiatives that focus in a more genuinely regional way on Indian Ocean economic and security issues. They include the Indian Ocean Rim Association (IORA) and the Indian Ocean Naval Symposium (IONS). These initiatives continue to play important niche roles.

IORA contributes to trade and investment facilitation among Indian Ocean littoral countries, with important input from six dialogue partners - China, France, Egypt, Japan, the United Kingdom and the United States. IONS, with Indian Ocean littoral states as members and with engagement by extra-regional states as well, effectively promotes maritime cooperation and productive information flows among relevant navies particularly in relation to doctrines, procedures, capabilities, organisational and logistical systems, maritime safety and operational processes.

These two Indian Ocean multilateral processes are highly desirable but are structured to achieve quite specific purposes. Neither constitutes a region-wide deliberative forum covering the broad range of Indian Ocean security and development issues. IORA is constrained by different levels of economic development among its members, by their different national and sub-regional priorities for promoting economic growth, and by their preference for different forms of economic cooperation and integration. IONS is a vital facilitator of navy-to-navy understanding and professional cooperation. But it does not encompass the political dimensions of regional security cooperation nor the wider dimensions of national security as perceived by regional states.

Future Indian Ocean Security Architecture

The key question for the future of the Indian Ocean's security architecture is how its existing and emerging gaps - at major power and more plurilateral levels - are going to be filled in order to accommodate the evolving challenges and opportunities in the region's security outlook. Some seek answers to that question through a search for grand structural initiatives to promote ever-broader security dialogue and cooperation. Others prefer a different, more targeted response focused on enhancement of 'hard power' capabilities and interaction among strategic partners and like-minded countries. Both these dimensions are relevant but neither is sufficient in its own right. The more productive way forward for the Indian Ocean's security architecture is a genuinely multi-layered one that addresses state security and human security challenges, and that is designed to promote strategic cooperation as well as manage the realities of strategic competition.

In my view, taking this multi-layered approach forward has three critical priorities.

The first derives from the changing geopolitical framework in which the security osmosis between the Indian and Pacific oceans is intensifying. It is doing so under the influence of trade flows, energy demands and cross-regional intersections of

strategic competition among the major powers, with mistrust and brinkmanship in one region reverberating in the other.

These Indo-Pacific intersections of major power interests are apparent at many levels. Patterns of rapid economic growth are driving new synergies among countries in East and West Asia, the Middle East and Africa. China's maritime interests, its naval capabilities and its strategic influence in the Indian Ocean are growing. American strategic interests and engagement in the region continue to intensify. The dynamics of India's 'Look East' policy is complementing its traditional Indian Ocean strategic focus with new dimensions of its engagement, including security cooperation in East Asia and the western Pacific. Japan's strategic priorities are also broadening from its Asian focus to its maritime interests in the Indian Ocean.

This emerging geopolitics of Indo-Pacific security puts a special premium on strategic dialogue and cooperation among the major powers whose policymaking shapes the outlook of both the Indian Ocean and Pacific Ocean regions so influentially.

This dimension of the Indian Ocean's security architecture is not designed to institutionalise a G2 or G3 or any other such G-plus arrangement to the exclusion of the interests of other states, regional or external. But agreements and undertakings among the most significant powers of the Pacific and Indian oceans on broadly-shared maritime security interests can facilitate a more comprehensive adoption of them by other states in both those regions. This would be particularly the case, for example, in relation to a formal agreement on, or specific undertakings for, managing incidents at sea.

The evolving Indo-Pacific security context means that such major power dialogue and cooperation in the Indian Ocean region can be facilitated by security outcomes in Asia-Pacific organisations such as APEC, EAS, ARF and the ASEAN-Plus consultative arrangements.

Constructive interaction among the major powers in the Indian Ocean can also be encouraged, promoted and even facilitated by other regional states including Australia, Indonesia, Singapore, South Africa and others.

The objective here is not for the major powers to impose outcomes on others. It is to recognise the particular weight and influence they bring to bear, and their capacity to provide a lead for other Indian Ocean countries in the achievement of common objectives, particularly in relation to freedom of navigation.

A second layer of a future multi-layered Indian Ocean security architecture encompasses the further evolution of bilateral alliances and security partnerships among regional countries.

This dimension of the region's security architecture, embracing (as it necessarily does) hard power capabilities, is not part of a zero-sum strategic competition and still less of any containment strategy. It reflects a logical pursuit of national interests in support of more broadly-shared objectives, particularly on maritime issues. This is true of Australia-United States alliance cooperation in the Indo-Pacific, as it is of other traditional and emerging security cooperation arrangements among countries including Australia, the United States, India, Republic of Korea, Singapore, Indonesia and others. Such alliance and security partnership cooperation will remain intensely relevant in the future in the Indian Ocean. It not only reflects shared interests and values among particular states but it also provides an important parameter for the strategic intentions of others.

The role of alliance and other security partnership arrangements in the Indian Ocean is inevitable. But it is also highly desirable that such arrangements reach out beyond a narrow focus. In particular, this means reaching out to China on critical issues of maritime security in the Indian Ocean. Many countries, including Australia, the United States and others already reach out extensively to China in their own bilateral defence arrangements. It will be increasingly important to take relevant opportunities to broaden such outreach from bilateral arrangements to those based on alliance or looser forms of security cooperation. The Indian Ocean region will be an important theatre for such strategic outreach.

Third, Indian Ocean security architecture will also need a range of robust forms of plurilateral cooperation as well as the development of new mini-lateral initiatives to address specific security challenges.

In terms of existing Indian Ocean arrangements, such as IORA and IONS, their important purposes will be advanced to the extent that such arrangements themselves evolve to meet emerging regional security challenges and to the extent that they are supplemented by other effective mini-lateral regional initiatives.

IORA has, in the past, been constrained in its effectiveness by the limitations of its charter and the diverse priorities of its member states and dialogue partners. It, however, has been given a new sense of focus and prioritisation by the meeting of its Council of Ministers in Perth in November 2013 and by the declaration they issued on 'the principles for peaceful, productive and sustainable use of the Indian Ocean and its resources' - the so called 'Perth Principles'.

As a result of the Perth meeting, IORA priorities are more practically focused on maritime safety, freedom of the high seas, disaster response and risk management, economic growth through regional trade facilitation and customs simplification, sustainable use of Indian Ocean resources, more effective fisheries arrangements and oceanic research as well as enhanced people-to-people links through tourism, education and business.

Despite the impetus given by the Perth ministerial meeting, IORA objectives still remain broad and aspirational. Over time, they will only achieve their potential if they are calibrated more specifically to benchmarks, timelines and practically-focused work. For example, an IORA working group could be focused explicitly on maritime energy security with the goal of developing practical steps to achieve a cooperative maritime security regime in relation to Indian Ocean energy flows and ocean management. A focus on such steps was proposed by the Report of the Australia India Institute Task Force on Indian Ocean Security in 2013.[1] It is a focus that needs to be taken seriously and, in my view, a revitalised IORA is the appropriate context in which to do so.

What is clear is that the Perth meeting has given IORA a new impetus in its own right. It has also opened an important window of opportunity to complement the remit and focus of IONS in ways that will strengthen the region's security architecture. IORA will maximise its contribution to that objective if it keeps its focus broad and practical - broad in the sense of addressing the policy dimensions of the state security and human security concerns of regional countries; and practical in the sense of a commitment to outcomes and not just processes, to accountability and not just aspiration.

In relation to IONS, its future evolution as a forum for enhancing professional naval exchanges, capacity building and interoperability will be critical for the effectiveness of the region's security architecture. This evolution, in my view, should include a more intensive focus on particular priorities, with clear benchmarks for achievement (including in relation to the collaborative capacity building on which the meeting is focusing) and with accountability arrangements for measuring progress, or lack of it, in relation to them. Those particular priorities would be for IONS itself to agree but, in my view, they should include freedom of navigation (including freedom from piracy), facilitation of maritime trade, safety of life at sea, environmental protection, information sharing, and humanitarian assistance and disaster relief arrangements. The future evolution of IONS will also inevitably encompass consideration of its membership and in that context the inclusion of China as an observer state in a first instance would seem to me a desirable and productive outcome - but again, that is properly a matter for IONS members to determine.

The security architecture of the Indian Ocean region would be further strengthened if arrangements such as IORA and IONS were complemented by other mini-lateral initiatives. This will be important if the Indian Ocean region is to develop an appropriately practical, adaptable and multi-layered security architecture.

In this context, *ad hoc* coalitions of willing and relevant states on particular issues of regional security concern will continue to have their place. We have seen their importance over recent years in countering piracy and there will be other similar maritime security challenges in the future that are amenable to such *ad hoc* coalitions.

There is also, in my view, a place in any future Indian Ocean security architecture for a Track II forum similar to the Council for Security Cooperation in the Asia Pacific (CSCAP) which has existed for over 20 years. Such an initiative in the Indian Ocean context has been persuasively proposed by my fellow panellist today, Lee Cordner. It would have the clear benefit of bringing together current and former government officials, academics, other experts and private sector representatives from countries with direct interests in the Indian Ocean region to address contemporary and emerging policy issues for regional governments and for regional forums. There are useful but largely disconnected initiatives with some of those characteristics that already currently exist. In my view, however, there would be real benefits in encompassing such initiatives in an overarching Track II dialogue on Indian Ocean issues, analogous to the highly productive role that CSCAP plays in the Asia-Pacific region.

Conclusion

The security architecture of the Indian Ocean region is never going to be a neat construct. This is a result of its scale, its diversity and the different priorities of its constituent states. A productive security architecture in the Indian Ocean is always going to have layers of bilateral and plurilateral interaction characterising it. The challenge is to make that mosaic as complementary, practical and intersecting as possible in order to advance the objectives of strategic stability and economic development that regional states share.

In that challenge, IONS has a vital contribution to make. The full potential of that contribution will only be realised if IONS continues to evolve in response to the more complex and contested security environment that will prevail in the Indian Ocean, and if its increasingly relevant aspirations are matched by practical progress. I wish you well in those vitally important responsibilities.

Notes

1 Dennis Rumley (ed), *The Indian Ocean Region: Security, Stability and Sustainability in the 21st Century*, Report of the Australia India Institute Task Force on Indian Ocean Security, Canberra, 2013, www.aii.unimelb.edu.au/sites/default/files/IndianOceanSecurityTaskforce.pdf.

Managing Maritime Security Risks in the Indian Ocean Region

Lee Cordner

The primary intent of this paper is to present ideas and recommendations for enhancing maritime security cooperation in the Indian Ocean region for consideration by the Indian Ocean Naval Symposium (IONS). Navies, coastguards and marine police are on the front line of maritime security prevention, response and recovery operations; their business is fundamentally about dealing with maritime security risks. Law and order at sea prevention and response, for example; and prevention, response and recovery from natural and man-induced disasters in the maritime domain, are part of core maritime enforcement business. There are significant challenges in this vast, diverse and disparate maritime region, particularly in devising cooperative, coordinated and collaborative approaches to addressing common, and to an extent shared, maritime security challenges that transcend national maritime boundaries and are beyond the remit and capabilities of any single nation to deal with. This paper addresses three things: concepts of risk, vulnerability and maritime security as they relate to the region; the outcomes of an indicative Indian Ocean region maritime security risk context review and risk assessment; and recommendations that IONS, in support of regional governments and regional entities like the Indian Ocean Rim Association (IORA), consider initiating and advocating risk-based approaches for progressing regional maritime security cooperation.

The focus is primarily on non-traditional maritime security problems, while recognising that the boundaries between non-traditional and traditional security issues tend to overlap. Traditional security concerns like inter-state conflicts and failed or failing states, for example, often generate and exacerbate non-traditional law and order at sea problems like illegal immigration, marine pollution, piracy and other criminal activities. Conversely, non-traditional security problems, like illegal, unregulated and unreported (IUU) fishing and maritime border infractions can inflame traditional security tensions and contribute to conflicts between states. In the Indian Ocean region, dealing with non-traditional maritime security challenges presents the greatest need for cooperation in the medium to longer term. It also provides opportunities, if regional actors are prepared to grasp them, of developing the mechanisms and habits for cooperation that may be of assistance with addressing traditional security concerns. Convergent national interests in tackling non-traditional maritime security challenges present the 'low hanging fruit' for inter-state and inter-maritime force cooperation.

Concepts of Risk, Vulnerability and Maritime Security

A significant initial challenge is to find ways for the primary players, the Indian Ocean littoral states and extra-regional states and their maritime forces and agencies, to participate in the same game on a common playing field. The first task therefore, is to find a common basis, an agreed means and methodology, for understanding the problems and developing options for dealing with them, upon which to construct cooperative efforts. Work toward common approaches needs to be based upon shared perspectives that will underpin uncontroversial and non-threatening collaborative strategies for enhancing mutually beneficial maritime security. Approaches to maritime security built upon shared perspectives of risks and vulnerabilities, supported by tried, tested, internationally accepted and widely employed risk management frameworks, offers mechanisms and processes that can help with this task. Risk management approaches, if employed assiduously, can assist with developing shared understandings of threats to common objectives, and importantly, can help to identify shared opportunities for mitigating commonly held risks and reducing vulnerabilities.

Concepts of risk in an international context were advocated by Ulrich Beck in his *World Risk Society* and related works.[1] Beck introduced several concepts that resonate in the region today. He suggested that in modern society the 'very idea of controllability, certainty or security...collapses' and a paradigm shift has occurred to present a 'world risk society' where Western and non-Western societies share the same space, time and challenges.[2] He suggested notions of 'risk communities' with shared risks that generate the need for cooperative approaches to dealing with massive challenges that are beyond the capability and mandate of any single nation-state or collective entity to address.[3] He also coined the term 'Cosmopolitan Condition' to describe the contemporary circumstance where common threats to society transcend national boundaries and include 'conditions of manufactured uncertainty' created by the actions of man.[4] Beck asserted that 'we are moving from a world of enemies to one of dangers and risks' and that risk 'is the modern approach to foresee and control the future consequences of human action, the various unintended consequences of radicalized modernity'. He advocated that risk analysis requires an interdisciplinary approach that 'demands an opening up of the decision-making process, not only of the state but of private corporations and the sciences as well'.[5] Beck's writings stimulated numerous commentary and critiques, with his concepts lauded by some and criticised by others.[6] The environmental security community have particularly embraced his concepts.[7]

ISO 31000:2009: *Risk management - Principles and guidelines* presents an internationally accepted conceptual framework and outlines a process.[8] Risk management is fundamentally about adopting a structured approach to dealing with uncertainty. ISO 31000 approaches are widely embraced by industry; they are deeply inculcated into corporate culture and processes, and foundational to management philosophy and practice. Managing risk permeates all levels of endeavour including corporate and strategic decision making, strategic leadership and management under the guise of enterprise risk management.[9]

ISO 31000 does not provide the entire answer to the quest for enhanced maritime security cooperation in the Indian Ocean region; however it provides a very useful starting point for developing common understandings and approaches that may lead to cooperative development. Some essential elements of risk management, as they relate to the regional maritime security challenge, are outlined as follows:

- Risk is defined as the 'effect of uncertainty on objectives'.[10] This simple and concise definition seems straightforward; however it assumes the existence of an organisation that has objectives.
- In the Indian Ocean region maritime security context the primary focus needs to be on the integrating and interconnected nature of the sea as it affects the objectives of those ashore. The nexus between organisations as systems with orientation to shared objectives and the region as a system that functions within and contributes to the international system is consistent with both general systems theories of organisations and international relations theories.[11] Viewing the region as a virtual organisation that is an open, expansive and inclusive maritime system, a composite oceanic and littoral region in which regional and extra-regional actors have common objectives, interests and shared risks and vulnerabilities, presents a workable basis for this analysis.
- The risk management process requires 'communication and consultation' in development and application combined with 'monitoring and review' as an essential feedback loop to ensure that it remains relevant and current.[12]

- There are three broad phases to managing risk; components of a continuous cycle:[13]
    - establishing the context entails articulating objectives, defining the external and internal parameters, and setting the scope and criteria for the subsequent steps of the process; note that the need to understand the security context is consistent with traditional military strategic concepts advocated by Clausewitz and Corbett, for example, that emphasise the importance of 'understanding the nature of a war'[14]
    - risk assessment is the overall process of identifying, analysing and evaluating risks
    - risk treatment involves selecting and applying options for removing, modifying or tolerating risks. Treatment options can include avoiding risks, taking risks in order to pursue opportunities, removing the source of risk, sharing risk, retaining (or accepting) risk, and changing the likelihood or consequences of risk.

Unlike risk there is no common, internationally accepted definition of vulnerability, although several exist in environmental and other literature.[15] A workable concept of vulnerability is needed as an adjunct to risk because in assessing the risks to security the probability and scale of hazards are not always numerically measurable; qualitative analysis is required in addition to quantitative analysis. Vulnerability rather than risk becomes the construct for devising security responses. The actions of irrational actors, like suicide bombers, and the aggregated and cumulative impacts of climate change, for example, are almost impossible to predict with any degree of confidence. For the purposes of this analysis vulnerability is defined as the state of susceptibility to harm from exposure to risks posing unquantifiable uncertainty combined with insufficient capacities to prevent, respond or adapt.

There is no single, internationally accepted definition of maritime security. Bateman characterised the inability for regional countries in the Asia-Pacific region to agree on a definition as a 'basic wicked problem' that presents difficulties for endeavours to develop regional cooperative approaches.[16] Further, there has been a curious separation between security and risk in academic literature because the two communities have divergent histories and, until recently, had hardly 'spoken' to one another. The nexus between risk and security has been highlighted by the 'increased focus on terrorism, climate change and other catastrophic transnational threats' that has brought the two fields closer together by providing a 'common empirical theme'.[17] Jayasuriya drew attention to the 'particular logic of security as risk management' that has caused the 'spatial and temporal boundaries of security' to shift 'from the national level' to a more regional approach.[18]

Risk and security are culturally and contextually 'defined concepts', which underscores the intellectual and practical challenges inherent in devising useful policy options in the diverse Indian Ocean environment.[19] Key considerations include the communal nature of risk and security concerns, noting that impacts will vary for different actors within a common system, and how this can translate into incentives to adopt collective and cooperative security risk mitigation strategies. For example, the impact of extreme weather events and sea-level rise may be catastrophic for some and a manageable annoyance for others. Geographic location, economic and human factors affect capacities to adapt and respond. However, massive human tragedies and related mass migration will affect all regional participants to a greater or lesser extent.

The maritime security context needs to be considered in a broad and inclusive sense as it intersects and overlaps with notions of economic, environmental, energy and human security in the maritime domain. A composite definition of maritime security, as it applies in the Indian Ocean region, is proposed as follows:

> Maritime security is a comprehensive concept that derives from the systemic nature of the maritime domain presenting multiple and inter-related requirements for cooperative security by state and non-state actors; it addresses traditional and non-traditional security challenges. Maritime security involves coordinating collective and cooperative risk mitigation and vulnerability reduction efforts in order to protect and promote national, regional and global vital interests, objectives and core values including those relating to state sovereignty, freedom of navigation, economic development, environment and ocean resources, human and social development, and political stability.

Indian Ocean Region Maritime Security Risk Context and Risk Assessment

Taking the risk-based approach, a brief outline of the product of an evolving, independent review of Indian Ocean maritime security strategic-level risks and vulnerabilities is presented below. A top-level overview of the outcomes of this work is presented here, it is not comprehensive or complete; most of the supporting analysis has been omitted. A strategic risk assessment for a region as complex, large and varied as the Indian Ocean region requires the combined efforts of many experts and perspectives being drawn together.

The maritime security risk context overview is presented under the following headings: law of the sea; environment and ocean resources; economy, trade and globalisation; energy; social cohesion and development; potential for interstate conflict; and regional security architecture. The analysis is forward looking; a time-horizon of 30 years and beyond is necessary to consider trends for issues like climate change. Generic, strategic objectives for the region, derived from the risk context analysis, are presented at the end.

Law of the sea

The *United Nations Convention on the Law of the Sea 1982* (LOSC) provides a framework for global oceans governance.[20] There are also numerous subordinate international regimes relevant to the maritime domain.[21] All Indian Ocean littoral states and significant extra-regional states have ratified LOSC with the exception of IORA member states Iran and the United Arab Emirates (both signatories in 1982 but not yet ratified), along with non-IORA states Eritrea and Israel, with the United States the only significant external maritime power that is not a signatory. Notwithstanding some lack of ratification, LOSC is very much ensconced as customary international law and variously employed by all actors in the international maritime system. LOSC presents a series of compromises designed to provide 'good order at sea' and to appease the sometimes opposing oceanic interests of states and other actors.[22]

Maritime sovereignty is important to regional and extra-regional actors as it defines rights and responsibilities. It underpins traditional security issues, like border security, as well as non-traditional security factors like resource and environmental exploitation and protection. Most maritime boundaries in the Indian Ocean have been satisfactorily delimited.[23] Varying interpretations of LOSC magnify jurisdictional tensions.

The integrity of the Indian Ocean sea lines of communication is vitally important to the interests of regional and extra-regional actors. Freedom of navigation to facilitate trade and permit the legitimate passage of warships and other activities, like scientific research, is a foundational principle of LOSC. Declarations made by littoral states that seek to impose some level of restriction on transit for example, through the Malacca Strait, the Strait of Hormuz or the Bab el-Mandeb can be problematic.[24] Some major maritime powers with significant interests in the region, like China and India, have allegedly taken an 'expansive view of coastal state authority', which puts them at odds with the United States that champions liberal interpretations of freedom of navigation as part of a long-term 'strategy of assured access to the global commons as an enduring American security interest'.[25]

Management, conservation and protection of the marine environment and oceanic resources are central tenets of oceans governance. Comprehensive, integrated approaches to oceans governance, advocated by LOSC, are not generally implemented in areas within national jurisdiction in the region, although there are efforts in this direction.[26] Similarly, efforts to promote integrated oceans governance in the high seas are at a nascent stage.[27] Many littoral states have limited capabilities to effectively police their maritime jurisdictions.

Environment and ocean resources

Environmental and ocean resource issues, exacerbated by the impacts of climate change, are emerging as the greatest maritime security-related challenges for the region in the medium to longer term.[28] Regional fisheries and other resources are under increasing pressure.[29]

The Indian Ocean littoral includes vast coastal zones; the maritime security implications of issues that arise in the area of interface between the land and the oceans require consideration. Predicted rising sea levels and temperatures combined with increasing incidence and severity of extreme weather events are likely to have dire impacts in the region where vast populations live in low-lying coastal zones and rely to a significant extent on the sea for their livelihoods.[30]

Climate change, environmental degradation, resource scarcity and natural disasters will have profound geostrategic implications in the region. The effects will transcend borders and will be felt predominantly in coastal areas, and the maritime domain. Many regional states are extremely vulnerable; they have little capacity to mitigate, adapt and respond. This emerging issue presents a compelling imperative for enhanced maritime security cooperation; the likely cumulative impacts will overwhelm national and regional resources.

Economy, trade and globalisation

The emerging prominence of the Indian Ocean economically and as a maritime trade route, with particular significance for energy and other bulk commodities, is well documented. While some economies in the region continue to experience strong growth, uneven economic development is profoundly evident; regional economies are largely commodity based and the economic outlook is fragile.[31]

The pressures that globalisation imposes are heightened in the region due to grossly uneven effects for states, institutions and peoples. More advanced states, like Australia, India and South Africa, are able to participate effectively in the globalised economy and have some capacity to adapt to issues like climate change. Developing regional states are less able to participate, and are likely to become increasingly marginalised and disenfranchised; generating regional security problems that will impact the Indian Ocean region system.[32] Globalisation and economic factors pose uncertainties that equate to risks that also present opportunities.

Energy

Energy security in the Indian Ocean is crucial to global and regional economies; access to West Asian oil remains a vital issue. The sea lines of communication are the world's most strategically important energy trade routes with the Strait of Hormuz the main energy supply link between the Persian Gulf region and the rest of the world. Much of this oil also passes through the Malacca Strait. The geopolitics of world energy is, however, changing.[33] The renewed focus upon domestic energy supplies in the United States combined with expanding dependence upon imported energy by China and India has major strategic significance for the Indian Ocean. The imperative for the world's greatest sea power, the United States, to support energy security in the region is declining while the strategic stakes for China and India continue to rise.

The demand for energy (oil, gas and coal) by India and China is forecast to massively increase into the medium term. India's demand for energy, for example, is projected to increase by 110 per cent by 2030; the vast majority of this will be imported as bulk cargoes by sea.[34] While India and China endeavour to diversify their energy sources the risks of interruption to supply mean that energy security and maritime security will be increasingly convergent.

Social cohesion and development

The Indian Ocean region is known for societal diversity, lack of homogeneity, and conflict. It harbours the majority of the world's refugees, internally displaced persons and 'international migrants' seeking a better life, the result of displacement caused by political violence and civil war; religious, racial and ethnic intolerance and discrimination; economic and environmental disadvantage; and natural/man-made disasters.[35] Massive migration generates enormous economic, social, political, and security challenges around the region that are likely to intensify. There are major implications for stability, and maritime security.[36]

Social, political and economic disintegration in the region provides a fertile environment for the proliferation of law and order issues. Organised crime: trafficking and smuggling of drugs, arms and people along with piracy and IUU fishing flourish where institutions are weak or non-existent. The number of non-state actors impacting security is reported to be growing substantially including the prospect of greater linkages between criminals, insurgents and terrorist groups.[37]

Potential for interstate conflict

The largest emerging interstate issue is the strategic rivalry between China and India, which until recently had entailed relatively minor territorial disputes on land.[38] China, India and other states that have hitherto relied upon US-assured maritime security must increasingly look to providing their own security insurance. China and India are making considerable investments in naval forces; both have expanding strategic and economic power combined with national security agendas that significantly focus upon maritime strategy and sea power.[39] The rapid rise of Chinese military power is putting India and the United States in a challenging position and China is extremely strategically vulnerable owing to dependence upon Indian Ocean sea lines of communication that are straddled by India and pass through narrow chokepoints at the northwest and northeast corners.[40] Opportunities for strategic miscalculation at sea will inevitably arise as the two Asian great powers project power, endeavour to assert sea control, and attempt to establish spheres of strategic influence. Indian Ocean regional conflicts on land have repeatedly had maritime security consequences.

The possession and proliferation of weapons of mass destruction (WMD), particularly nuclear weapons, remains a most troubling transnational problem. India, Pakistan, Israel and potentially Iran possess nuclear weapons, along with the United States, China, France, Russia and Britain who have the capability to deploy nuclear weapons into the region. There exists the possibility of strategic miscalculations between nuclear states having dire consequences, and the abiding prospect of nuclear weapons (or other WMD) falling into the hands of terrorist organisations.[41]

Most regional states have limited maritime enforcement and defensive capabilities; many are unable to effectively patrol marine areas under their national jurisdictions. The lack of national capabilities is exacerbated at regional and sub-regional levels by the lack of cooperative bodies to coordinate sparse resources and manage crises. Western powers remain engaged, particularly in West Asia, in support of their interests in global energy security and in dealing with the sources of Islamist extremism. The involvement of external states helps to stabilise regional security. In many cases, such involvement is essential to make up for shortfalls in the security capabilities of regional states although external intervention is not universally welcomed by regional states.[42]

Regional security architecture

There are no region-wide multilateral security architectures and mechanisms for dealing with maritime security, and other security dialogue and cooperation, in the Indian Ocean region at the government-to-government level below the United Nations. IORA does not include security in its charter and its membership is restrictive; several important Indian Ocean littoral states are not members. However, four of the six priority areas identified by IORA potentially involve enhancing maritime security: (i) maritime safety and security, (iii) fisheries management, (iv) disaster risk management, and (v) academic, science and technology; an opportunity potentially exists for constructive proposals for enhancing regional maritime security cooperation to be progressed.[43] The only other region-wide maritime security entity is IONS, which has an expanded membership. IONS involves maritime security force leaders that primarily deal with operational and technical cooperation between regional maritime forces.[44]

Strategic objectives for maritime security

From the Indian Ocean region maritime security context analysis, a composite list of 15 generic strategic objectives is derived.

Indian Ocean region strategic objectives for maritime security	
Strategic Objective 1	Attain and sustain maritime territorial sovereignty
Strategic Objective 2	Assure freedom of navigation in accordance with LOSC
Strategic Objective 3	Implement effective conservation, protection and management of the marine environment in areas within national jurisdiction and the high seas
Strategic Objective 4	Address the uneven effects of globalisation across the Indian Ocean region system
Strategic Objective 5	Promote economic development and enhance intra-regional and extra-regional maritime trade
Strategic Objective 6	Ensure the integrity of energy (oil, gas and coal) maritime supply routes throughout the Indian Ocean region
Strategic Objective 7	Assert effective, sustainable control over fish and other resources (including energy and minerals) within areas of national jurisdiction and the high seas
Strategic Objective 8	Implement effective measures to address the impacts of climate change
Strategic Objective 9	Implement effective management of the coastal zone around the Indian Ocean littoral

Strategic Objective 10	Develop cooperative natural disaster response and recovery mechanisms
Strategic Objective 11	Promote social tolerance, cohesion and stability founded upon economic and societal development and integration
Strategic Objective 12	Impose law and order consistent with international regimes and norms
Strategic Objective 13	Establish a nuclear weapons and other WMD free zone in the Indian Ocean; prevent WMD proliferation, particularly nuclear weapons; remove nuclear weapons and WMD; prevent extra-regional states and other actors bringing WMD into the Indian Ocean
Strategic Objective 14	Encourage political order in Indian Ocean region states and promote regional stability
Strategic Objective 15	Develop regional maritime security dialogue and cooperation architectures in the Indian Ocean region

Table 1: Indian Ocean region strategic objectives for maritime security

Maritime security risk assessment

The risk context provides the basis for the next part of the risk analysis: risk assessment. The risk assessment aims to identify factors that may threaten the achievement of the defined objectives, and importantly, it can be used to highlight opportunities that can be pursued toward achieving objectives. A significant outcome of the risk assessment process is to identify priorities that will inform subsequent treatment options.

A generic or typical risk criteria framework is employed in this analysis as outlined in Tables 2 and 3. A risk criteria framework provides a useful tool for developing comparative perspectives of the relative imperatives to address particular risks. This usually involves consideration of the likelihood of a risk arising along with the consequences should it occur. The combination of likelihood and consequence can be used to determine the overall level of risk, known as the risk profile.[45] In the Indian Ocean region maritime security case, the primary requirement is to identify system-wide risks, and analyse and evaluate often cumulative, aggregated and interdependent consequences. This involves primarily qualitative analysis based upon experienced judgment.

Likelihood (probability of a risk occurring)	**Consequences** (impact upon the maritime system)	**Risk Profile** (combined assessment of likelihood and consequence)
Almost Certain	Extreme	1. Very High
Probable	Serious	2. High
Possible	Major	3. Medium
Unlikely	Minor	4. Low
Remote	Negligible	5. Very Low

Table 2: Risk criteria

The combined likelihood, consequence and risk profile can be effectively presented in tabular form as shown in Table 3. The relationship between likelihood and consequence is often not a direct one. For example: a risk that has 'extreme' consequences and is 'almost certain' to occur would be assessed as 'very high'; a risk with 'serious' consequences and 'remote' likelihood would be assessed as 'low'.

Consequence	**Likelihood**	**Almost Certain**	**Probable**	**Possible**	**Unlikely**	**Remote**
Extreme		1	1	2	3	3
Serious		1	2	2	3	4
Major		2	2	3	3	4
Minor		3	3	4	4	5
Negligible		5	5	5	5	5

Table 3: Risk profile matrix

From the risk assessment, 19 maritime security risks have been identified as shown in Table 4.

Indian Ocean Maritime Security Risks	
Maritime Security Risk 1	Transgressions of sovereignty in the territorial sea
Maritime Security Risk 2	Transgressions of sovereignty in the exclusive economic zone
Maritime Security Risk 3	States asserting unreasonable maritime sovereignty claims
Maritime Security Risk 4	State closures of international straits, archipelagic sea lanes and/or areas within national jurisdiction
Maritime Security Risk 5	State restrictions on freedom of navigation in international straits, archipelagic sea lanes and/or areas within national jurisdiction
Maritime Security Risk 6	Non-state actors impinging upon freedom of navigation (piracy, maritime terrorism)
Maritime Security Risk 7	Impacts of climate change on the marine environment
Maritime Security Risk 8	Illegal exploitation of marine living resources, in areas of national jurisdiction and the high seas
Maritime Security Risk 9	Marine pollution and dumping
Maritime Security Risk 10	Inadequate regulation and control of the marine environment
Maritime Security Risk 11	Sea-level rise and increasing intensity and frequency of extreme weather events in coastal zones and islands
Maritime Security Risk 12	Law and order at sea transgressions: crime, piracy, robbery, smuggling, trafficking, illegal immigration, IUU fishing
Maritime Security Risk 13	Disruption of energy cargoes at sea
Maritime Security Risk 14	Offshore oil and gas safety and security incidents
Maritime Security Risk 15	Transportation and deployment of WMD, primarily nuclear weapons, at sea
Maritime Security Risk 16	Local, state on state, conflict spilling into the maritime domain
Maritime Security Risk 17	Maritime intervention (power projection, asserting sea control) by major powers in the Indian Ocean region
Maritime Security Risk 18	Safety at sea
Maritime Security Risk 19	Lack of an Indian Ocean region architecture and entities to facilitate regional maritime security dialogue and cooperation

Table 4: Indian Ocean region maritime security risks

Indian Ocean region maritime security risk assessment outcomes are collated in Table 5. The number code represents the overall level of risk or risk profile. An 'x' indicates strategic objectives impacted by a particular maritime security risk.

Strategic Objective / MS Risk	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Overall Risk	1	2	2	3	3	3	2	2	2	2	1	3	2	3	3	3	2	3	1
1	x	x	x	x	x	x		x	x	x		x		x	x	x	x		x
2			x	x	x	x						x	x	x	x	x	x	x	x
3	x	x	x				x	x	x	x		x		x		x	x	x	x
4				x	x		x				x	x	x				x		x
5			x	x	x	x		x			x	x	x			x	x		x
6			x	x	x	x						x	x	x		x	x		x
7	x	x	x			x	x	x	x	x		x		x			x		x
8							x			x	x								x
9	x		x				x			x	x	x				x			x
10							x				x					x	x		x
11			x	x	x	x	x				x	x				x	x	x	x
12	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
13	x		x									x			x	x	x		x
14	x	x	x	x	x		x	x	x		x	x	x	x	x	x	x		x
15	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x

Table 5: Indian Ocean region risk assessment matrix

The composite picture of risks against objectives presents a useful strategic overview that can highlight discontinuities and areas of convergence. Opportunities are presented for targeting collective and cooperative maritime security risk mitigation or risk treatment efforts. A concise supporting narrative is also necessary. Shortcomings inherent in this kind of coarse presentation of relative risk profiles also need to be recognised. The granularity and important nuances of the risk assessment can be suppressed; particularly important in a strategic level risk assessment for a complex system, like the Indian Ocean region.

Risk treatment, the next phase of the risk management continuum, lies beyond the scope of this paper. Regional and extra-regional state and cooperative entities, in collaboration and consultation with regional maritime security forces and other national and multilateral agencies, need to develop cooperative strategies for treating the risks. Developing and implementing effective strategies requires a comprehensive, shared understanding of the context and common risks and vulnerabilities.

Concluding Summary and Recommendations

In this overview of the Indian Ocean region strategic risk context, the sea is a vital common medium for internal and external actors, primarily nation-states. Sea lines of communication are central to regional trade and vital to the global economy. As the global economic and strategic balance swings toward Asia with India, Indonesia and other Indian Ocean states emerging; and as an increasingly powerful China looks south and west, so the geopolitical focus on the Indian Ocean magnifies. Changes in regional power balances, with China and India rising and the United States relatively declining, are major factors that impact security. The potential consequences from climate change are likely to have the greatest impact in the medium to longer term. They will present profound challenges to regional environmental, human, food and economic security.

Many regional states have little capacity to fulfil their responsibilities for managing marine zones. Exploitation, pollution, and water-security infringements largely proceed unchecked in many national jurisdictions, and the high seas. Few regional countries have the capacity to deal with massive human tragedies and environmental damage to coastal areas forecast to arise from repeated natural disasters. The lack of national capabilities is exacerbated by the lack of regional bodies to coordinate the use of sparse resources.

There is much uncertainty, and therefore unmitigated risks, in the Indian Ocean region maritime security context. Understanding risks and vulnerabilities in the region presents the potential for regional actors to engage in a positive, constructive and non-confrontational analytical approach that will assist in defining common maritime security challenges and opportunities, and help to identify collective and cooperative strategies. Risk management offers methodologies for defining collective risk mitigation strategies: regional agendas for action.

Cooperative maritime security in the Indian Ocean could, if managed astutely and prudently, bind a diverse and largely disaggregated region. The opportunity exists for nations to cooperate to protect vulnerable shared interests and further common objectives without significantly compromising territorial integrity or sovereignty, against a range of risks that no single state has the ability to address. Effective maritime security cooperation, driven by assessments of risk, will become increasingly necessary to address security challenges common to regional and extra-regional actors.[46]

This strategic analysis of the Indian Ocean region maritime security risk context has demonstrated that a risk-based approach offers utility. This indicative first step needs to be followed by an evaluation of mitigation options, followed by action.

The following actions are recommended, while acknowledging that some are probably beyond the purview of IONS; IONS leaders can be influential in encouraging progress:

- Commission a multinational, multi-disciplinary team of experts to conduct a regional strategic risk assessment, with a specific focus upon maritime security leading to proposals for enhanced regional maritime security cooperation. This could be originated by IONS, as an IONS initiative.
- IONS encourage IORA to expand the priority agenda to include the maritime impacts of climate change to compliment maritime safety and security, disaster response and fishing.
- IONS encourage expansion of IORA membership to be more inclusive of Indian Ocean region participating states.
- IONS encourage/support the creation of a Track 2/Track 1.5 Indian Ocean region security dialogue entity. The Indian Ocean Research Group could provide the foundation, if appropriately supported and resourced.
- IONS support creation of a separate Track 1 security dialogue entity or elevation of IORA to the summit level and expansion of the IORA charter to include security dialogue.

There is an imperative to develop maritime security cooperation in the Indian Ocean region to address traditional and non-traditional security risks and vulnerabilities. The maritime domain is where the collective interests and common security concerns of regional and extra-regional states largely converge. Both regional and extra-regional actors, those with interests in the Indian Ocean and the capacity to assist, need to be included in security dialogue and cooperative arrangements. Combined risk, vulnerability and security approaches offer the potential to move forward.

NOTES

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Economic Importance of Fisheries in the Indian Ocean

Mary Ann Palma-Robles

The Indian Ocean comprises more than 30 littoral states characterised by diverse fisheries resources, fishing economies, cultures, fishing practices, priorities and challenges, management approaches and legal regimes. Fisheries have a significant role in achieving food security, poverty alleviation and economic development. To help address food security, fish contributes up to 50 per cent of the animal protein intake in some Indian Ocean countries. As the most traded commodity in the world, it provides a substantial contribution to gross domestic product and up to 90 per cent of export earnings, as well as livelihood and employment, thereby contributing to the goals of poverty alleviation and economic development.

The vastness of the ocean, diversity of its littoral states, and richness of the resources make the Indian Ocean a unique marine space requiring the conservation not only of commercially valuable species but also its surrounding ecosystems both within areas of national jurisdiction and the adjacent high seas. Apart from the various legal and policy frameworks in place for fisheries matters in individual coastal states, a number of regional fisheries bodies have been established to promote the sustainability of these resources. However they have limited functions and jurisdiction and only address issues that relate to the conservation of fisheries resources.

This paper examines the emerging challenges in fisheries that have a direct impact on maritime security in the Indian Ocean. Examples of these challenges include the use of fishing vessels for acts of terrorism and other illegal activities, involvement of organised criminal groups in illegal fishing and trade of resources, and harassment of fishing vessels by naval vessels in disputed areas. It will be argued that these issues are of increasing concern because of their potential risk and impact on regional security. One of the key challenges in addressing these issues is the lack of adequate global and regional legal, policy, institutional and operational frameworks that can guide littoral states, and in particular their navies, coastguards, and relevant authorities to prevent and manage resource-related threats to maritime security.

The paper is divided into five sections. The first considers the economic significance of Indian Ocean fisheries, particularly patterns of fish production and trade which justifies the need for their conservation. The second focuses on some of the key issues confronting the region in addressing the sustainability of fisheries. This is followed by an examination of the security related challenges to Indian Ocean fisheries. The fourth summarises the commitments of regional and sub-regional fisheries bodies to address conservation issues and highlights their limitations in dealing with security related challenges. The last part of the paper provides some thoughts on how maritime security issues in fisheries may be integrated within an Indian Ocean regional framework and what the role of navies may be to facilitate opportunities for regional cooperation.

Indian Ocean Fisheries

The region's fishing sectors comprise a complex mix of large scale (commercial and industrial), small scale (inshore, coastal, artisanal and traditional), and recreational fisheries. Aquaculture also supports marine fish capture in the region. The eastern Indian Ocean comprises coastal and offshore fisheries that target small and large pelagic and demersal finfish such as sardines, mackerels, anchovies, scads, threadfin breams, and crustaceans, with the use of non-motorised and motorised vessels equipped with trawls, longline and purse seine gears. The northwest Indian ocean region which includes the Persian Gulf, the Red Sea, the Arabian Sea, Gulf of Oman and the Gulf of Aden have varying levels of catch of demersal and small and large pelagic types such as croakers, groupers, Indian oil sardines, Bombay duck, anchovies, tunas and mackerel. Shrimp and rock lobster are some of the high value fisheries in the sub-region. The fisheries in the southwest Indian Ocean are also multi-species with lobster, crab, shrimp, sharks and reef fishes as the major artisanal and industrial species. In this sub-region, tuna and tuna-like species are also key commercial fisheries providing foreign income to the littoral states, such as Maldives, Mauritius and Seychelles. Inland fisheries also contribute to the national consumption and income of Kenya and Tanzania.[1]

Fish in the Indian Ocean comprise a significant component of global catch. Together with that of the western and central Pacific Ocean, the fish catch in the eastern and western Indian Ocean comprised 28 per cent of the total world catch in 2011.[2] Historical catch in both the eastern and western Indian Ocean increased from the 1970s although the catch in the western Indian Ocean tapered off between 2000 and 2010 suggesting the fisheries were at full capacity. Several fisheries in the western Indian Ocean have been assessed as fully fished or overfished. As an example, the Food and Agriculture Organization reports that the narrow-barred Spanish mackerel, a migratory species found in the Red Sea, Arabian Sea, Gulf of Oman and Persian Gulf, and off the coasts of Pakistan and India, is fully fished to overfished. Another stock assessment in the southwest Indian Ocean on

140 species found that 25 per cent of these species were overfished while 75 per cent were fully fished or under fished.[3] After high incidences of piracy between 2007 and 2009 in the western Indian Ocean, the sub-region saw a growth in catch with a record high of 4.5 million tonnes in 2012.

The eastern Indian Ocean has experienced an upward trend in historical catch since the 1970s. Data from 2012 records a high level catch of 7.4 million tonnes. Catches in the Bay of Bengal and Andaman Sea have increased steadily and there are no signs of it levelling off. This increase may be attributed to the expansion of fishing activities to new areas and species.[4] However it has been noted that about 42 per cent of the catch in the sub-region is attributed to the category 'marine fishes not identified' which suggests a lack of accurate monitoring and assessment of stocks necessary for the allocation of resources and decision making on fisheries.

As the Indian Ocean witnesses a continuous growth in fish catch, it is in the interest of its littoral states to conserve fisheries not only to ensure their sustainability but also the viability of the fishing economy. Hence the management of fisheries resources also entails the protection of surrounding ecosystems, specifically large marine ecosystems from the Agulhas current from the south west, Somali coastal current, Red Sea, Arabian Sea, Bay of Bengal, to the west coast of Australia. In addition to marine mammals, the Indian Ocean is also known as one of the more diverse regions for deep sea resources on the high seas, including deep sea sharks, batoids and chimaeras which remain insufficiently studied.[5] These are examples of resources that require the cooperation of Indian Ocean states to harmonise management measures. Apart from fisheries data collection and analysis, adoption of input and output control and measures, application of an ecosystem approach to fisheries, an important component of effective fisheries management, is the enforcement of regulations and achievement of fisheries objectives.[6] The navies, coastguards and other enforcement agencies therefore play a crucial role in protecting these resources.

Fisheries Concerns in the Indian Ocean

A number of fisheries challenges confront the Indian Ocean region. While concerns vary in intensity depending on the state, these issues are largely shared by the eastern, north-western and south-western sub-regions. These challenges relate to the management of fisheries resources and may be divided into four sets of issues. The first challenge concerns the actual fisheries: such as overfishing; overcapacity; illegal, unreported and unregulated (IUU) fishing; poor data collection; and inadequate stock assessment. The second set of challenges concerns the marine environment and ecosystems in the Indian Ocean, such as coastal and marine pollution, habitat destruction, extreme environmental occurrences, and the impact of climate change on fisheries.[7]

The third challenge is the fish trade, particularly the post-harvest losses due to the lack of capacity in the downstream industry and the lack of competitive advantage of local or small scale fisheries in international markets and trades. There is also increasing and more stringent regulation on IUU fishing that impacts on the ability of developing states to trade with major importing partners such as the European Union, the United States and Japan. The fourth set of challenges relates to governance and focuses on the lack of effective fisheries management, domestic legal and policy frameworks, comprehensive regional approaches, dispute resolution mechanisms, and effective monitoring, control and surveillance.[8] This issue includes the limited involvement of navies in fisheries enforcement. Similarly, as will be discussed below, the lack of a harmonised regional approach to fisheries management issues is one of the factors that hinders the effective conservation and protection of these resources.

Fisheries-Related Security Challenges in the Indian Ocean

In addition to conservation issues, the Indian Ocean faces emerging issues which directly impact on the maritime security of the region. These issues are outside the framework of fisheries management and are threats to national and regional security. Examples of these threats include the use of fishing vessels for acts of terrorism and other illegal activities, involvement of organised criminal groups in illegal fishing and trade of resources, and harassment of fishing vessels by naval vessels. These threats highlight longstanding issues of resource scarcity or high level exploitation, territorial disputes and undelimited maritime boundaries, and inadequate governing domestic and international frameworks, among others. Although considered as significant national security issues by Indian Ocean states, these problems are increasing in number and magnitude but are yet to be considered of significant risk and regional importance.

Most of the resource-related security issues remain unaddressed in domestic legislation, and are also largely undocumented with details not made easily available in the public domain. These issues not only impact on the conservation of fisheries but also threaten peaceful relations between states, pose risks to the safety of fishing vessels and crews, and create conflict and regional instability, none of which may be addressed adequately in fisheries legislation and policy. The sophisticated multi-jurisdictional nature of these resource-related maritime security threats also makes it difficult for the international community to adopt international instruments specific to address such problems. Another challenge is the lack of an adequate and harmonised regional legal, policy, institutional and operational framework that can guide littoral states, through their navies, to prevent and manage, and eliminate such threats.

Fisheries and piracy off the coast of the Horn of Africa

Piracy in the western Indian Ocean is a concrete example of how a security challenge proves to have a considerable impact on the conservation of fisheries resources. While the exploitation of commercially valuable fisheries resources and the dumping of toxic waste in Somali waters have been identified as two factors that have purportedly led to the involvement of some fishermen in piratical attacks, recent reports by the Indian Ocean Tuna Commission (IOTC) suggest the increasing threat of piracy off the coast of Somalia is due to the sustainability of tuna resources.[9]

There are two key consequences of such illegal activities in the region. One negative consequence is the relocation of fishing effort as a result of piracy in the western Indian Ocean. The IOTC notes the substantial displacement of longline catch and effort into traditional albacore fishing areas, which increases fishing pressure on this species. For example, Japan has reported a decrease of about 80 per cent in the bigeye and yellowfin tuna catch by a number of its longline vessels between 2006 and 2011. Similarly, Iran-flagged gillnet vessels targeting tropical tuna species on the high seas have moved back into the Iranian exclusive economic zone to fish for neritic tuna and tuna-like species, or are now fishing for yellowfin or longtail tuna in the Arabian Sea. Vessels of other distant water fishing nations such as China, Taiwan and the European Union have also shifted their fishing activities into other areas of the Indian Ocean, and the Atlantic and Pacific oceans. A fishing vessel flagged to Republic of Korea was hijacked in 2006 leading to a 50 per cent decrease in the number of its active vessels in the following year. The fear of piracy attacks has caused the relocation of fishing effort which in turn has resulted in substantial increases in total catch of some species which are already subject to overfishing. Small scale fisheries have seen a decreased number of participants and effort as a result of piracy occurring in the exclusive economic zone.[10]

The second consequence of piracy attacks in the western Indian Ocean is the observed decrease in compliance monitoring. The IOTC noted that observer coverage in the region has decreased as a result of piracy threats. Observer programs are important monitoring and compliance tools for fishing activities on the high seas but are expensive to conduct. These concerns have been exacerbated by piracy attacks and have resulted in a low level of observer coverage below 5 per cent which is significantly below the minimum requirement to monitor tuna fishing activities.[11]

With an increased military presence and the combined efforts of navies to address regional piracy, fishing activities began to increase in the western Indian Ocean in 2012. However, the link between fisheries and piracy issues remain unaddressed. Most domestic legislation is inadequate to address the use of fishing vessels to perpetrate acts of piracy, particularly with respect to finding the beneficial owner and registration history of the fishing vessel, determining a sufficient link between the beneficial owner interest and criminal activity gain, and more importantly in protecting crew and promoting safety of life at sea. Pirates have used fishing vessels of various sizes, from small skiffs to large trawlers carrying weapons of differing firepower.[12]

While it can be argued that under Article 103 of the *United Nations Convention on the Law of the Sea 1982* (LOSC), a fishing vessel used or intended to be used for the purpose of piracy automatically transforms it into a pirate ship which in turn allows states to apply universal jurisdiction over the criminal act, there are inherent legal and practical challenges with respect to the application of such jurisdiction. The key legal impediment is the lack of explicit obligation to prosecute pirates or to surrender them to a willing prosecuting state, as well as the requirement to enact legislation that would facilitate universal criminal jurisdiction over piracy. Similarly, another key related impediment is the lack of political will, interest and capacity to prosecute or cooperate in the prosecution of pirates.[13] These challenges are evident in the limited number of prosecution of Somali pirates.

Even with the adoption of relevant United Nations resolutions and increased collaboration between navies, the lack of domestic legal instruments and political will power can significantly impede the effective deterrence and prevention of piracy at sea. Current fisheries legislation also does not take into account maritime security concerns such as piracy in the conservation of fisheries resources. Similarly, states belonging to regional fisheries management organisations such as the IOTC have very limited enforcement jurisdiction on these issues, and the IOTC has not adopted measures to address maritime security related challenges.

Fisheries and transnational criminal activities

Apart from piracy, the involvement of transnational criminal groups in fisheries related crimes is a significant maritime security challenge. The United Nations Office of Drugs and Crime (UNODC) examined the existence of transnational crime in the fishing industry and made several conclusions providing a link between organised criminal groups and fisheries. The report highlighted:

- Some fishers are trafficked for the purpose of forced labour at sea. These fishers experience severe physical and sometimes sexual abuse, cruel and inhumane treatment, coercion, and several instances of reported deaths.
- Child trafficking exists in the fishing industry.
- Marine resource crimes occur in relation to high value, low volume species such as abalone. Some of these criminal activities are linked with trafficking of narcotics which serve as a barter arrangement for the resources. The laundering of illegally caught resources involves fraudulent documentation.
- Fishing vessels are used for the purpose of smuggling arms and people, trafficking of narcotics, and acts of terrorism. Fishers are believed to be recruited due to their knowledge of and skills at sea.[14]

Some of these conclusions can be affirmed in notable examples of transnational crime involving fishing vessels in the Indian Ocean. For example in 2008, the Indian fishing trawler MV *Kuber* was hijacked to transport terrorists and arms into Mumbai. The crew were removed from the vessel while the master was asked to remain onboard because of his navigational skills; both the master and crew were later killed.[15] Similarly in 2010, there were media reports of fishing vessels caught by Yemeni authorities carrying weapons and involving a number of Indian and Somali crew.[16] In 2013 an Iranian cargo vessel was caught smuggling weapons by the Yemen navy off the Red Sea coast.[17] The Environmental Justice Foundation published a report and made a film that detail accounts and testimony of victims of human trafficking for forced labour in Thailand's fishing industry.[18] While some of the perpetrators were successfully apprehended by enforcement authorities, the involvement of organised criminal groups in these illicit activities raises the possibility of similar incidents being either undetected or undocumented.

UNODC further highlighted a number of factors that make the fishing industry susceptible to transnational organised crime, including the global reach of fishing vessels, lack of effective monitoring of fishing vessels, lack of transparency on identity of beneficial owners of vessels, continuous decline of global stocks, poor socio-economic conditions of fishers and fishing communities, lack of effective flag and port state jurisdiction, corruption, and lack of international regulation on the safety of fishing vessels and working conditions of fishers.[19] In order to respond to some of these issues, states have underlined the importance of increasing the understanding of the link between transnational crime and fisheries in international fora while at the same time recognising the distinct legal regimes and remedies available under international law to address illegal fishing and transnational organised crime.[20] Apart from the UNODC investigation, Interpol established a fisheries crime working group to develop the capacity, capability and cooperation of member countries to effectively address fisheries crimes. The working group also aims to facilitate the exchange of information, intelligence, and technical expertise between countries for the purpose of fisheries law enforcement.[21] The coastal states of the Indian Ocean, through their navies, coastguards and marine police will greatly benefit from the active participation of Interpol and other relevant international discussions on fisheries and transnational crime.

The involvement of transnational criminal groups in fisheries has only limited visibility within the region but some coastal states have taken a more proactive approach towards the problem. For example, Australian state and territory governments have amended their fisheries legislation to penalise 'trafficking in fish'.[22] Although such legislation only addresses illegal fishing and the trade in certain species, it recognises the opportunistic participation of organised criminal groups in marine resource related crimes. In 2009, Indonesia amended its national fisheries legislation to include provisions criminalising illegal fisheries activity. Although in their early stages of legal development, these examples may serve as a model for addressing the nexus between maritime security threats and fisheries conservation concerns. Other countries may not have specific legislation to address these issues but have enacted anti-money laundering and counter-terrorism related legislation which establishes reporting and identification mechanisms that may determine the use of fishing vessels for organised crime and financing of such illicit activities. The legal intersect between these bodies of law need further development.

Involvement of organised criminal groups in illegal trade of high value, low volume species

A more specific type of fisheries crime is the illegal capture, transport and trade of high value, low volume species or those species with smaller population densities and slower maturation rates. Apart from abalone and rock lobster, the commodities involved include shark fin, seahorse, eels, sea urchins and trepang.[23] Some of the species in the Indian Ocean region which are known to be affected by this type of trade and may be at risk of further decline include humphead wrasse, giant grouper, blacksaddled coral grouper and squaretail coralgrouper.[24] These species are part of a lucrative trade in exotic and live reef fish bound for restaurants and the aquarium industries in China, Taiwan, Hong Kong and Singapore.

The fish that enter the live market may be classified into three categories: wild-caught market size fish, which comprise about 50 to 70 per cent of the total trade; undersized fish grown in cages or ponds until their market size is reached, making up 15 to 40 per cent of the trade; and fish reared from eggs in aquaculture, comprising about 10 to 15 per cent of the trade.[25] In order to regulate the market of live reef fisheries, legal and policy measures need to be in place targeting the illegal harvest, rearing, transport, and trade of specific species. These issues are addressed through the regulation of trade in certain species, limitation on fish size, establishment of permit systems for the export, transport and culture of fish bound for international trade, and prohibition on the use of destructive fishing practices. However such measures mainly focus on fisheries management and do not address the potential involvement of organised criminal groups. As highlighted above, only a few countries in the Indian Ocean region have addressed the latter, and only Australia has adopted a more specific legal approach to address the illegal trade of high value, low volume species. A number of countries in the region also have legislation that relates to tracking the proceeds of crime which may also be applicable in addressing this problem.

Fishing vessel and naval vessel encounters

Conflicts between states may arise as a result of squabbles for fisheries, particularly in disputed areas and regions with undelimited maritime boundaries, and conflicts have a negative spiral effect on the conservation of fisheries resources, protection of national and regional security, and promotion of safety of life at sea. These issues refer to incidents involving fishing vessels being harassed by military vessels, stand-off and close encounters between naval vessels of neighbouring states, low overflights on fishing or military vessels, and in some circumstances, arrest of fisheries officers by foreign naval officers onboard government monitoring vessels. Such incidents have resulted in increasing confrontation between military forces and excessive use of force against fishing vessels, causing fishermen either injury or trepidation. These conflicts have also resulted in diplomatic protests, accusations of threats to sovereignty, public concern and uproar, imposition of economic sanctions, increased displays of military and naval might, and resort to legal dispute mechanisms. Challenges related to fishing in disputed areas transcend resource management problems and have gone beyond accusations of intrusion and arrest of fishing vessels, to become examples of conflict at sea and an extension of maritime security and regional stability issues. Currently these incidents are known to have heightened tensions between states in the South China and East China seas; however there may be isolated and undocumented encounters between fishing and naval vessels in the Indian Ocean which may also pose risk to regional stability.

The case of the Enrica Lexie

In February 2012, the members of the Italian Navy onboard an Italian flagged oil tanker MT *Enrica Lexie* fired on an Indian fishing trawler killing two of its crew in the Laccadive Sea, which is in India's exclusive economic zone. The oil tanker was escorted to Kochi by the Indian Coast Guard and was allowed to leave after the owners posted a surety bond. Two members of the Italian Navy were arrested, detained and later released on bail.[26] Both the Indian and Italian governments have conducted separate investigations and the court proceedings resulted in diplomatic tensions between them.

The *Enrica Lexie* case represents a complex mix of civil and criminal lawsuits and questioned the jurisdiction of the local court in incidents occurring outside the territorial sea limit. It also raised important concerns relating to international law on piracy, rights of private armed guards onboard merchant vessels, sovereign immunity, rules of engagement, and international criminal jurisdiction. For the navy and other enforcement authorities, this case raises two key legal and operational issues. One issue is on the extension of sovereign immunity enjoyed by government vessels to officers onboard commercial vessels, and the second is the gradual application of force on vessels suspected of criminal activities. The different legal practices of states to address these issues add to the intricacy of solving such disputes.

Regional Framework on Fisheries in the Indian Ocean

The cooperative framework on fisheries in the Indian Ocean involves the establishment of regional organisations with three different functions: policy advice, scientific, and management and compliance. The regional organisations with policy advice and scientific functions include the Bay of Bengal Programme Inter-Governmental Organization (BOBP-IGO), Regional Commission for Fisheries (RECOFI), Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden (PERSGA), and the Southwest Indian Ocean Fisheries Commission (SWIOFC). Regional fisheries bodies with a management framework focus include the Indian Ocean Tuna Commission (IOTC) and the South Indian Ocean Fisheries Agreement (SIOFA). The SWIOFC is also in the process of adopting management measures for its area of competence. Other extra-regional bodies or organisations outside the Indian Ocean but whose states are members include the Commission for the Conservation of Antarctic Marine Living Resources (CCAMLR), Commission for the Conservation of Southern Bluefin Tuna (CCSBT), Western and Central Pacific Fisheries Commission (WCPFC), and the Asia-Pacific Fisheries Commission (APFIC). Apart from having different mandates, these organisations are of various membership, area and species coverage.

A summary of membership, area of competence and species coverage for the key fisheries organisations in the Indian Ocean are summarised in Table 1:

Regional Body	Area of Competence	Species coverage	Members
BOBP-IGO	exclusive economic zone, high seas	All marine fish stocks	Bangladesh, India, Maldives, Sri Lanka
RECOFI	Areas under national jurisdiction	All living marine resources	Bahrain, Iraq, Iran, Kuwait, Oman, Qatar, Saudi Arabia, UAE
PERSGA	The Red Sea, the Gulf of Aqaba, the Gulf of Suez, the Suez Canal to its end on the Mediterranean, and the Gulf of Aden	All elements of the marine and coastal environment	Djibouti, Egypt, Jordan, Saudi Arabia, Somalia, Sudan, Yemen

SWIOFC	Areas under national jurisdiction	All living marine resources	Comoros, France, Kenya, Madagascar, Maldives, Mauritius, Mozambique, Seychelles, Somalia, South Africa, Tanzania, Yemen
IOTC	High seas and areas under national jurisdiction	Tuna and tuna-like species in the Indian Ocean and adjacent seas Non-target species of ecological importance	Australia, Belize, China, Comoros, Eritrea, European Union, France, Guinea, India, Indonesia, Iran, Japan, Kenya, Madagascar, Malaysia, Maldives, Mauritius, Mozambique, Oman, Pakistan, Philippines, Republic of Korea, Seychelles, Sierra Leone, Sri Lanka, Sudan, Thailand, United Kingdom, Tanzania, Vanuatu, Yemen Cooperating non-members: Senegal, South Africa.
SIOFA	High seas	All marine fish stocks (non-highly migratory species)	Australia, Cook Islands, European Union, Mauritius, Seychelles

Table 1: Summary of regional fishing bodies in the Indian Ocean region

The duty to cooperate is one of the key obligations of states in conserving and managing resources in the exclusive economic zone and on the high seas. However the nature and structure of Indian Ocean regional organisations have a number of weaknesses. One weakness is the lack of comprehensive fisheries management measures across the region. The sub-regional and regional bodies have different and sometimes overlapping area and species coverage and provide varying policy, scientific and management advice to member states with little attempt at harmonisation. Most of the organisations also adopt policy recommendations but do not have the mandate to implement binding measures for their member states. Although these limitations are integral to the functions of these regional fisheries organisations, they generally address fisheries management concerns. However they do not have the mandate to address resource related maritime security concerns such as transnational criminal involvement in fisheries and encounters between fishing and naval vessels. The IOTC for example could only raise piracy as a potential factor impacting on the effective management of tuna resources in the region; however it has not and cannot adopt specific measures to prevent piracy attacks.

Another key limitation that needs to be addressed at a regional level is monitoring, compliance and enforcement. Only IOTC has established a monitoring and compliance mechanism for member and cooperating non-member states to implement agreed conservation and management measures for tuna and tuna resources. Other regional fisheries management organisations have adopted various monitoring, control and surveillance measures to a lesser extent. However as in most regional fisheries management organisations in various oceans, navies play a very limited role in fisheries enforcement in the Indian Ocean region, particularly on the high seas.

Developing a Regional Strategic Framework to Address Resource Related Security Concern and Conflicts in the Indian Ocean Region

The complexity and multiplicity of fisheries and maritime security concerns in the Indian Ocean require a robust strategic framework that integrates both management and regional security legal and policy frameworks within a collaborative institutional arrangement. An integrated regional (or sub-regional) approach may offer a solution to the prevention and deterrence of resource related security issues in the Indian Ocean. One benefit of such an approach is the potential to prevent risk and disperse tensions related to territorial disputes and access to resources, as well as those incidents which may be politically motivated. Addressing these issues in a regional forum may be timely as wider consultation and dialogue offering a common solution may mitigate any damage that these conflicts may cause between states. The navy, coastguard and other enforcement authorities, being the first response to security incidents at sea play a crucial role in establishing such framework.

Some of the key factors that may shape the development of a multilateral strategic approach to address resource-related security concerns in the Indian Ocean follow.

Resource related security issues

The Indian Ocean littoral states may first need to consider whether the challenges discussed above pose significant threats and risks to regional security and stability that require immediate or future action. Are these threats confined to certain sub-regions or is there a general concern that needs to be addressed in a wider context? Using a risk assessment framework or similar pragmatic approach, this includes determining which issues may be considered a priority in comparison to other maritime security concerns in the region, the level of risk they pose to Indian Ocean states, and the legal and operational response available to such countries and what may be deemed appropriate. How do resource-related challenges fit in the wider maritime security discussions in the Indian Ocean?

Scope of participation

Marine resource conflicts or challenges have a slightly different set of actors or participants compared to other maritime security discussions. In the Indian Ocean and the wider Indo-Pacific, one can observe the increasing power of coastal states in exercising sovereign rights over resources in the exclusive economic zone, which include limiting the access of distant water fishing nations or prescribing the terms and conditions of access. Trading states or net exporters and importers of fish also have a significant role to play in addressing conservation and security concerns in fisheries. The shifting balance in power between coastal and access states in the region will require an assessment to determine the scope of participation in and leadership of regional cooperation.

Geographical area

As highlighted at the beginning of the paper, the Indian Ocean may be divided into several sub-regions in terms of fisheries resource exploitation, conservation, and management. These sub-regions have different levels of enforcement capability and some have very specific resource management concerns. Would it be more practical for the Indian Ocean region to be divided into sub-regions for the purpose of addressing resource conflicts and maritime security related challenges? Would such division compartmentalise issues that can impede states from effectively addressing common concerns?

Level of cooperation

In terms of a successful management of fisheries resources and fisheries enforcement, it has been increasingly recognised at the domestic level that institutional cooperation, such as a whole-of-government approach is necessary. However, such is not the same at the regional level. Navies, coastguards, customs and other authorities with fisheries enforcement related functions have very limited roles in managing shared resources in regional waters, with a notable exception in high seas boarding and inspection in the western and central Pacific Ocean. The flag state remains the key enforcement jurisdiction on the high seas, supplemented by port state enforcement. How can enforcement authorities in the Indian Ocean be effectively engaged in fisheries discussions?

Regional institutional arrangement

Can the functions of existing regional fisheries bodies be extended to address emerging security challenges? Can the region also benefit from a dispute resolution mechanism for such issues? How can existing regional and practical arrangements such as IONS be called upon to take an initiative to address threats to fisheries and other ocean resources? While there have been attempts by other arrangements such as IORA to include marine environmental and fisheries issues in one of its program priorities, such objectives still require further development to address specific security concerns which IONS may be able to provide even through a small working group. Increasing the role of navies in addressing maritime security concerns in fisheries might allow the development of a framework that addresses specific issues such as the operational aspects of combating transnational crime in fisheries and establishing rules of engagement and law on the use of force that apply to fishing vessel and naval vessel encounters at sea. Similar to other regions, it may be more practicable for navies to develop specific measures such as codes of conduct for encounters at sea, incidents at sea agreements, and maritime hotlines, among others.

Supporting domestic framework

Any regional approach would need a supporting, and ideally, a harmonised domestic framework (or approach), especially in addressing the fisheries related security challenges. Would the domestic framework require amendment to fisheries legislation or the crimes act, or simply the broadening of maritime enforcement powers?

Other factors

In addressing resource related security challenges in the Indian Ocean, other factors may also be considered such as existing limitations in the international legal framework, external power influence, and regional alliances.

Conclusion

As conventional fisheries management transform into transnational security challenges without any clear legal or practical approach towards resolution, one can only anticipate how such issues may progressively threaten peace and stability in the Indian Ocean and wider Indo-Pacific region. Addressing resource related security challenges requires thorough understanding of the intricacies of these issues, sound application of rules of international law, and cooperative regimes that will address the different facets of the problem. In addition to understanding the political and legal framework, a robust operational framework

implemented by navies, coastguards, marine police and other agencies is also necessary to prevent threats, control or reduce the risks involved, and manage incidents at sea. These can only be achieved through strengthened cooperation in the Indian Ocean at regional and sub-regional levels.

Notes

1 The eastern Indian Ocean includes eastern India, Sri Lanka, Bangladesh, Myanmar, western Thailand in the Andaman Sea, western Malaysia, and southern and western Indonesia; see Peter Flewwelling and Gilles Hosch, 'Subregional Review: Eastern Indian Ocean', in Cassandra de Young (ed), *Review of the State of World Marine Capture Fisheries Management: Indian Ocean*, FAO Fisheries Technical Paper no 488, Rome, 2006, p. 35.
The northwest Indian Ocean includes Bahrain, Djibouti, Egypt and Israel on the Red Sea coast, Eritrea, west coast of India, Iraq, Iran, Jordan, Kuwat, Oman, Pakistan, Qatar, Saudi Arabia, Somalia, Sudan, United Arab Emirates, and Yemen; see Gary Raymond Morgan, 'Subregional Review: Northwest Indian Ocean', in de Young, *Review of the State of World Marine Capture Fisheries Management: Indian Ocean*, p. 57. The south-western Indian Ocean includes Kenya, Mozambique, South Africa, the United Republic of Tanzania, Comoros, Madagascar, Maldives, Mauritius, and Seychelles; see Stephen Cunningham and Clotilde Bodiguel, 'Subregional Review: Southwest Indian Ocean', in de Young, *Review of the State of World Marine Capture Fisheries Management: Indian Ocean*, p. 68.

2 Food and Agriculture Organization (FAO), *The State of World Fisheries and Aquaculture 2014*, Rome, 2014, p. 38.

3 FAO, *The State of World Fisheries and Aquaculture 2014*, pp. 40-41.

4 FAO, *The State of World Fisheries and Aquaculture 2014*, p. 40.

5 FAO, 'Report on the FAO Regional Workshop on the Development of Species Identification Guides for Deep-sea Cartilaginous Fishes of the Indian Ocean', Flic en Flac, Mauritius, 16-18 January 2013, *FAO Fisheries and Aquaculture Report No. 1050*, Rome, 2013, p. 4.

6 FAO, 'Fisheries Management,' *FAO Technical Guidelines for Responsible Fisheries No 4*, Rome. 1997, p. 7.

7 For more thorough discussions, see de Young, *Review of the State of World Marine Capture Fisheries Management: Indian Ocean*.

8 See Edward N Kimani, Gladys M Okemwa and Johnson M Kazungu, 'Fisheries in the Southwest Indian Ocean: Trends and Governance Challenges,' in Ellen Laipson and Amit Pandya (eds), *The Indian Ocean: Resource and Governance Challenges*, Henry Stimson Center, Washington DC, 2009.

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10 Indian Ocean Tuna Commission, Report of the Sixteenth Session of the IOTC Scientific Committee, Busan, Republic of Korea, 2-6 December 2013, paragraphs 152-156, www.iotc.org/sites/default/files/documents/2014/01/IOTC-2013-SC16-RE.pdf.

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13 Douglas Guilfoyle, 'Prosecuting Somali Pirates: A Critical Evaluation of Options', *Journal of International Criminal Justice*, vol 10, no 4, 2012, pp. 774-775, 777.

14 See UNODC, *Transnational Organized Crime in the Fishing Industry: Focus on Trafficking in Persons, Smuggling of Migrants, Illicit Drug Trafficking*, Vienna, 2011, pp 1-3, www.unodc.org/documents/human-trafficking/Issue_Paper_-_TOC_in_the_Fishing_Industry.pdf.

15 'Mumbai Terrorist Attacks (November 26-29, 2008)', www.fas.org/irp/eprint/mumbai.pdf, p. 4.

16 'Yemen seizes another fishing boat carrying weapons for Shi'ite rebels', Worldtribune.com, 18 May 2010.

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18 Environmental Justice Foundation, *Sold to the Sea-Human Trafficking in Thailand's Fishing Industry*, 2013, http://ejfoundation.org/sites/default/files/public/Sold_to_the_Sea_report_lo-res-v2.pdf.

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Climate Change and Sea-Level Rise: Seaports, Security and Stresses

Jean Palutikof

This paper explores the effects of climate change on naval operations, including the management and operation of seaports. It looks at how future climate change may affect where the emphasis of naval operations may lie globally, in particular how global trading patterns may change, and how global tensions may emerge and shift as a result of climate change impacts, and hence where the focus of defence concerns may lie.

It is important to emphasise, from the outset, that this paper is concerned with anthropogenic climate change. Climates are variable over short timescales (seasonally, inter-annually and over 5-10 years in response to large-scale forcing such as the El Niño-Southern Oscillation effect). Indeed, climate change has always occurred, most notably with the onset and retreat of Ice Ages in response to fluctuations in the orbit of the Earth around the Sun.

But the climate change under discussion here is anthropogenic. Through the addition of greenhouse gases to the atmosphere, such as carbon dioxide and methane, humanity is causing a warming of the atmosphere, and this is influencing all aspects of the climate, including the occurrence of extreme events such as floods, droughts and windstorm. Natural levels of atmospheric greenhouse gases are essential for life on Earth as we know it. These gases are relatively transparent to incoming radiation from the Sun, but absorb the longer wave outgoing radiation from the Earth. As a result, atmospheric temperatures are warmer than they would be in the absence of these greenhouse gases. However, human activities, notably through industrialisation and the internal combustion engine, intensification of agriculture and deforestation, are adding greenhouse gases to the atmosphere, and causing global temperatures to rise. Since the beginning of the 20th century, global atmospheric temperatures have risen by around 0.7° C.

Computer-based models of the Earth-Atmosphere system are used to understand how future climates may evolve, based on scenarios of future emissions of greenhouse gases. The assumptions underlying these scenarios can range from a very 'green' future in which strong global efforts are made to limit greenhouse gas emissions, through to business-as-usual scenarios in which economic growth continues unabated, based on fossil fuels. Very broadly speaking, these future projections imply a global warming of between 1.5° C and 4° C, depending on emissions, by the end of the present century.

The Role of the IPCC

Much of the scientific information on climate change that filters through to the general public comes from the Intergovernmental Panel on Climate Change (IPCC). There are many misapprehensions about this organisation, ranging from one extreme - that it is a large research institution - through to the other - that it is an environmental pressure group. In fact, it is neither of these two things, and it is worth spending a little time describing just what is the role and purpose of the IPCC.

The IPCC was set up by the United Nations (World Meteorological Organization and United Nations Environment Programme) to carry out assessments of climate science research and literature, to underpin the international negotiations around greenhouse gas emissions reduction. Its role is purely to carry out scientific assessments - it does not engage in research, and its assessments should be policy relevant but never policy prescriptive. The main assessments of IPCC take place under three working groups (WG): WGI on the physical science, WGII on impacts, adaptation and vulnerability, and WGIII on mitigation. Each assessment takes of the order of 6-7 years to complete, and involves many thousands of scientists from across the world. Part of the reason for this lengthy process is that the assessments are extensively reviewed by scientists and policymakers, with three cycles of review of each chapter.

The final step in the process of producing an assessment report for each Working Group is the approval meeting. The principal findings of the assessment are summarised into a *Summary for Policymakers*, a document about 12-14 pages in length. At the one-week approval meeting, representatives of each government on the Intergovernmental Panel (which is every member country of the World Meteorological Organization or United Nations Environment Programme, that is, virtually every country in the world) meet with the lead scientists of the assessment to approve each statement of the *Summary for Policymakers*. This may require some quite extensive rewording in order for governments to reach agreement. On the basis of the approval of the *Summary for Policymakers*, the whole report of the working group is accepted by the Panel. The international negotiation around greenhouse gas emissions reduction then take place within the context of the IPCC assessment reports, the findings of which are accepted by all the governments taking part in the negotiations.

In fact, therefore, the assessments of the IPCC are rigorous, impartial and unbiased assessments of the most up-to-date science around climate change. They represent the consensus view of the science and policymaking communities around climate change. As such, they are an authoritative voice on climate change, and there is no better source of information on the latest thinking in the field.[1]

What Does the Latest Science Tell Us?

The IPCC is just completing its Fifth Assessment. This latest scientific assessment is summarised in the summaries for policymakers of each working group. The key statements from WGI in the Fifth Assessment, of relevance for this audience, are that:

- Ocean warming is largest near the surface, and the upper 75m of the oceans warmed by 0.11° C [confidence range 0.09 to 0.13] per decade over the period 1971 to 2010.
- Global sea levels rose by 1.7 [1.5 to 1.9] mm yr^{-1} between 1901 and 2010, 2.0 [1.7 to 2.3] mm yr^{-1} between 1971 and 2010, and 3.2 [2.8 to 3.6] mm yr^{-1} between 1993 and 2010.
- The increase in global mean surface temperatures for 2081-2100 relative to 1986-2005 is projected to be in the range 0.3° C to 1.7° C (for a very low emissions scenario) to 2.6° C to 4.8° C (high emissions scenario). Highest rates of warming will be in the Arctic, and the continents will warm faster than the oceans. As a result, it is very likely that heat waves will occur with a higher frequency and duration.
- Global mean sea-level rise for 2081-2100 relative to 1986-2005 will likely be in the ranges of 0.26 to 0.55m for a low emissions scenario through to 0.45 to 0.82m for a high emissions scenario. For the latter (and note we are tracking at or above this level at the present time), the rise by the year 2100 is 0.52 to 0.98m.[2]

Implications for Australia: Seaports, Security and Stresses

The implications of climate change for Australia are many. Research has tended to focus on the impacts that will take place within the country, ranging from impacts of increased heat waves in our cities on human health and wellbeing through to changes in crop yields and the implications for agriculture. These changes will be important for Australia, but the nation is wealthy, peaceful and well-educated, so that it is well positioned to adapt successfully. More important for Australia, although certainly much less well researched, are the impacts of changes that will take place overseas, affecting global trading patterns, defence and the allocation of foreign aid. Here, I briefly consider some potential internal and external effects of climate change on Australia relevant to the Indian Ocean Naval Symposium, as well as the interaction of climate change with other stresses.

Seaports

The integrity and operation of seaports are clearly vulnerable to aspects of climate change. For example, sea-level rise may require that infrastructure is re-engineered to take into account changed conditions; increased frequency of wind storm and flooding may disrupt operations and damage infrastructure. My institution, the National Climate Change Adaptation Research Facility, recently funded a project at RMIT University into 'Enhancing the resilience of seaports to a changing climate'. In the synthesis volume from this project, Darryn McEvoy and Jane Mullett consider in detail the exposure of Australian seaports to climate change and propose a set of adaptation guidelines which they summarise as follows:

- Ensure executive understanding and commitment to adaptation.
- Build or secure appropriate technical capability - to undertake climate risk assessments, and to assist with implementing adaptation options, and ongoing monitoring.
- Work in partnership - climate impacts do not respect borders, working with relevant partners contributes to more effective outcomes.
- Understand risks and thresholds - ideally identified and analysed through some form of risk assessment process.
- Manage highest priority risks first, in a balanced way with non-climate risks.
- Employ adaptive management principles to cope with uncertainty - that is, iterative decision making, incorporating feedback, and testing/updating of assumptions.
- Look for 'no/low regrets' and 'win-win' adaptation options - those that as well as reducing the risks of climate change impacts help produce other benefits.
- Avoid 'maladaptation' - or actions that limit future adaptation options.
- Ensure adaptation is effective, and is reviewed regularly - reducing risks without introducing unintended effects.
- Ensure adaptation is efficient - long-term benefits outweigh the costs.
- Adaptation measures are equitable - the effects of different adaptation efforts and the costs should be considered across different groups/sectors.[3]

Security

There are three areas where what happens elsewhere will have impacts for Australia: trade, defence and aid.

With respect to global trade, why does it matter for Australia? Australia is an exporting nation, mainly of primary commodities from agriculture and mining. Something like three quarters of Australia's agricultural production is exported in non-drought years. Thus, Australia may benefit from climate change if other food producers experience adverse impacts of climate change but, conversely, may be faced by rising global prices and diminishing national supply if climate change has a negative impact on home production.

The effects of climate change on global food prices have security, defence and foreign policy implications. We can already see from past events the kinds of effects we may be facing - inflation in food prices triggered more than 60 riots worldwide between 2007 and 2009, and a major contributor to this inflation was adverse climate conditions.

There are other international implications arising from climate change. Large-scale migration is already a permanent feature of most developing nations, and remittances from overseas workers make large, sometimes essential contributions to national economies. Climate change is very likely to exacerbate this trend. Sea-level rise is already posing threats to the viability of some small island nations in the Pacific and Indian oceans, and the number of islands affected will grow in the future. For some of these islands, large-scale and permanent out-migration is the only feasible adaptation in the long term to climate change. The expense and impracticality of building sea defences for small low-lying island nations makes this inevitable. Elsewhere, although there is not the same inevitability, it is likely that increasing frequencies of extreme events such as droughts and floods will damage local economies to the extent that rates of out-migration rise markedly. Countries that already see high levels of incoming economic migrants and refugees are very likely to see a rise in numbers, and new countries are likely to be affected.

Finally, climate change impacts on developing countries are likely to have implications for Australia's foreign aid programs. New demands will be made on finite resources, as the geographical patterns and intensities of natural disasters such as floods and cyclones shift and change.

Stresses

At present, the greatest risks arise from climate change acting together with, or exacerbating, other stresses. In itself, climate change is a risk that well-governed and prosperous countries can effectively manage without due detriment to the wellbeing of the population. The greatest risks arise when the impacts of climate change are felt together with other stresses and, in particular, the stresses imposed by war and civil unrest, by poor and corrupt governments and institutions, and in societies weakened by poverty, ill-health and out-migration. Without these stresses, societies have the capacity and will to manage climate change.

Exceptions to this exist where the limits to adaptation have already been reached. Some small island states are already perilously close to this point - however good the institutions and government, however wealthy the country, in the end they will be overwhelmed by the inevitability of sea-level rise. As we move forward into an era of increasingly severe impacts from climate change, more exceptions will emerge.

Conclusions

In conclusion, there are five messages I hope that readers will take away from this paper:

1. As a result of human activities, the climate is changing and will continue to change.
2. As a result of human activities and global warming, global sea levels are rising and will continue to rise.
3. Impacts of climate change on seaports in Australia will be mainly from extreme events.
4. However, the main impacts of climate change for Australia will come from events overseas.
5. Climate change at present is a manageable risk except when it acts together with, or exacerbates, other stresses.

Notes

1 The results of every assessment are available in full and free of charge for download from the website at www.ipcc.ch.

2 TF Stocker, D Qin, G-K Plattner, M Tignor, SK Allen, J Boschung, A Nauels, Y Xia, V Bex and PM Midgley (eds), 'Summary for Policymakers', *Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change*, Cambridge University Press, Cambridge, 2013.

3 D McEvoy and J Mullett, *Enhancing the resilience of seaports to a changing climate: Research synthesis and implications for policy and practice*, Work Package 4 of Enhancing the resilience of seaports to a changing climate report series, National Climate Change Adaptation Research Facility, Griffith University, 2013; these reports are available from www.nccarf.edu.au.

Petroleum Supply and Trade Security Challenges in the Indian Ocean Region

Rupert Herbert-Burns

In the context of aggregate proven reserve base and the exploration, production and conveyance of oil and gas, the Indian Ocean region is arguably the most strategically significant of all the world's maritime spaces. The corollary to this in terms of the vital security of the region's petroleum energy system is not merely axiomatic, it is arguably essential to the maintenance of macro-economic security and the geopolitical stability of the whole Indo-Pacific maritime realm. The objective of this paper is to highlight the factors that combine to support this position.

Following a brief empirical outline of the current status of the region in terms of oil and gas source, supply, trade and markets, this paper is split into three main sections: an examination of the features that combine to make up the ontology of the petroleum energy system in the region; the second section discusses some key challenges in trying to ensure the security of petroleum supply and trade in the region; this is followed by a concise section that posits some recommendations for initiatives that could improve the capacity for states to enhance security for their parts of the petroleum energy system within the region as increasing future Asian demand raises the criticality of this security commensurately.

In terms of spatial and maritime geography, socio-economics, and oil and gas supply, production and trade, the Indian Ocean region is a complex and unique canvas. Distributed around and amidst some 21.45 million nm^2 (approximately 20 per cent of the world's total water surface area), the 36 states that exist within it have 35.4 per cent of the world's population and almost 40 per cent of the of the planet's coastline. Aside from the considerable volume of containerised cargo processed by regional ports (approximately 30 per cent of the global total), some 42.5 per cent of global crude oil, product and distillate trade is lifted from and within the region.[1] More impressive still are the statistics for the reserves, production and movement of gas: the region is home to 49.6 per cent of global proven reserves; almost a third of all global gas production; and, just under 56 per cent of the total liquefied natural gas (LNG) lifted by sea.[2] Finally, 18.1 per cent - almost a fifth - of the globe's aggregate refining capacity occurs here. The region's primary refining nodes - Jubail, Jamnagar and Singapore - have reshaped the composition and pattern of the region's petroleum trade so significantly that these facilities are now amongst the most strategically significant industrial sites in the northern Indian Ocean.

Two other geopolitical and trading phenomena lend context and gravitas to the statistics listed above - chokepoints and sea lines of communication. The presence of the Strait of Hormuz, Malacca Strait, Suez Canal and Bab el-Mandeb (through which collectively over 80 per cent of all global tanker-lifted oil passes), and the fact that the world's busiest single sea lane along the global east-west-east trade belt passes through the northern Indian Ocean (linking: Suez, Bab el-Mandeb, the northern Arabian Sea, the Strait of Hormuz, the southern tip of Sri Lanka and Singapore) is one of the world's foremost maritime geostrategic and trading interconnectors.[3]

The Petroleum Energy System

In focusing more specifically on the petroleum sector, it is useful to set out the components of what is referred to in this paper as the petroleum energy system. The six components, or features, include: the oil and gas reserve base; the processes of petroleum exploration, development and production (E, D & P); export terminals and shipping; sea lines of communication (referred to in this paper as strategic petroleum streams); strategic refining hubs and petroleum gateways; and, physical markets (or points of oil and gas discharge, consumption or redistribution).

Reserve base

The primary oil and gas reserve base of the Persian Gulf and Arabian Peninsula is well-known (see Tables 1 and 2); however, there are some fast developing probable and possible reserves that will begin to recast the geographical framework of oil and gas sources in the region with commensurate impact on requirements for production infrastructure, conveyance and security.

Country	Oil reserves as % of global total	Strategic source volume indicator
Saudi Arabia	15.9	Exceptional - Global
Iran	9.4	Very High - Global
Iraq	9.0	Very High - Global
Kuwait	6.1	High - Global
UAE	5.9	High - Global
Qatar	1.4	Medium - Global

Table 1: Middle East oil reserves[4]

Country	Gas reserve as % of global total	Strategic source volume indicator
Iran	18	Exceptional – Global
Qatar	13.4	Exceptional – Global
Saudi Arabia	4.4	Very High
UAE	3.3	Very High
Australia	2	Very High
Iraq	1.9	Medium
Indonesia	1.6	Medium
Egypt	1.1	Medium
Kuwait	1	Medium

Table 2: Middle East natural gas reserves[5]

The tanker and very large gas carrier processing facilities, storage farms, loading terminals and conveyance flow lines that originate from the country sources listed in the above tables are long established and high developed. With the exception of Iran's major oil processing and loading infrastructure (which is still operating at below optimum export capacity due to ongoing sanctions at the time of writing) they are as heavily utilised as the designers intended. Indeed, the majority of these source countries are currently engaged in substantial exploration, development and production programs to boost volumes for export; most notably in Saudi Arabia, Iraq, Qatar, UAE, Oman and Australia.

Exploration, development and production

However, it is the emerging new sources of supply that are capturing the attention of the world's major international oil companies. Once these sources are more fully explored and the proven deposit volumes more comprehensively assessed, the means of production and export have the capacity to significantly alter the scale and growth-rate of the economies of the sovereign countries in which the reserves exist. The areas of greatest interest and potential are the east coast of Africa, both the east and west coasts of India, the northern reaches of the Bay of Bengal and the north-western and west coasts of Australia.

India's oil and gas industry has great potential for growth. Currently, only 50 per cent of the country's petroleum basins have been explored, and much of the promising offshore acreage has yet to be surveyed in order to establish the geology's hydrocarbon bearing potential; in particular, the deep-water blocks of the Kerala and Krishna-Godavari basins. The country's aggregate hydrocarbon endowment is currently estimated at approximately 2 billion metric tonnes of oil equivalent.[6]

The Sangu and Shwe basins in the north-eastern reaches of the Bay of Bengal represent the petroleum geology that is generating the greatest interest for international oil companies. In the second half of 2014, Myanmar's government will announce the results of tenders issued to explore the 30 allocated offshore Shwe blocks. Some commentators have suggested that this is one of the most eagerly awaited events in the recent history of the oil and gas industry, and that those of the world's largest international oil companies (including Chevron, Shell, Statoil and Total) declared successful in their bids, will have the licences to explore arguably some of the most important unexplored offshore acreage in the world. Unofficial estimates by geology experts believe that Myanmar's offshore acreage could be on a par with Brazil's pre-salt basins.[7]

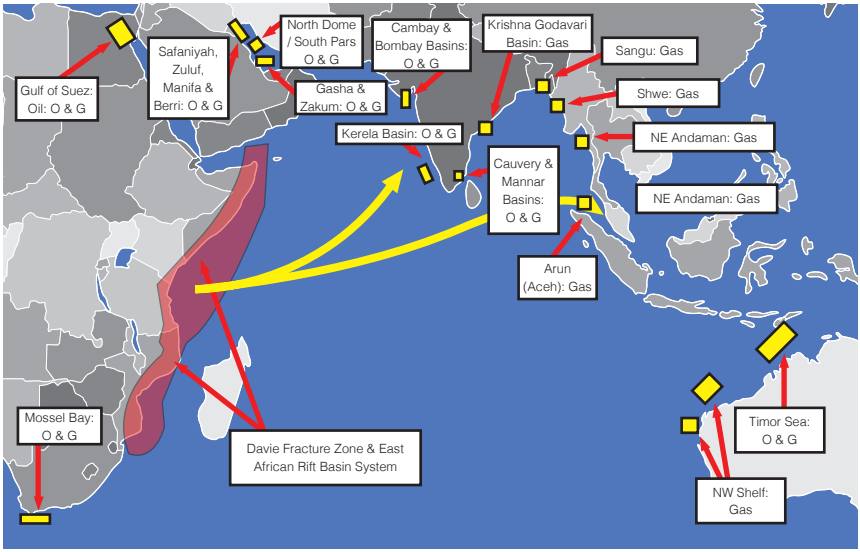

Figure 1: Existing, developing and emerging sources of oil and gas

However, it is the east coast of Africa that has the greatest potential to significantly re-shape the geopolitical and operational characteristics of the region's petroleum energy system in the short to medium term. Though Uganda is not currently producing oil or gas, crude oil production is expected before the end of the decade. Exploration and development projects are centred on companies such as Tullow, Total, and the China National Offshore Oil Corporation. In general, the plans call for an eventual target production of 200,000 blue barrels per day, a 30,000-60,000 blue barrels per day refinery, and the development of a crude oil export pipeline to the port of Lamu in Kenya.[8] Much of this production, allocated for export to the region via Lamu, will add significantly to Kenya's importance as a regional export gateway for Sub-Saharan Africa's increasing petroleum production and export capacity. Analysts have suggested that Uganda could have the largest onshore oil reserves in Sub-Saharan Africa and could become one of the most important producers in Africa. The government has revised upwards the country's estimated oil reserves from 2.5 to 3.5 billion barrels.[9]

Mozambique and Tanzania currently represent the powerhouses of petroleum reserve, production and export potential in east Africa. Since large-scale exploration commenced in 2010, there have been a series of very large offshore gas discoveries that are of sufficient aggregate volume to justify commercially viable LNG production/export trains. Anadarko and ENI are the dominant international oil companies in northern Mozambique's Ravuma Basin. Between them, the two companies have discovered over 100 trillion cubic feet (tcf) of gas, which is sufficient to support the building of what could be the world's second largest liquefaction and export complexes after Ras Laffan in Qatar.[10]

North of the border, a consortium of BG Group, Ophir and Temasek, and another pairing Statoil and ExxonMobil, are leading exploration activities in Tanzania. Together, the two groups have discovered around 35tcf of natural gas resources, which could support two 5 million-tons per year LNG trains. Some analysts are indicating that additional finds could provide sufficient feedstock for a third train. The most bullish estimates have indicated that Tanzania's upside proven reserves potential could be as high as 60tcf of natural gas.[11] However, it is very expensive and time-consuming to commoditise natural gas for LNG conversion and conveyance, and current estimates stand at between seven and ten years for an export-ready terminal.

Enormous gas reserve discoveries off northern Mozambique and Tanzania have given rise to speculation that east Africa could eventually become the third largest exporter of natural gas in the world, with the primary destinations being India and China. This would lead to a new and potentially very substantial LNG stream emanating from Mozambique or Tanzania towards India and East Asia via the Malacca Strait. However, given the signing of one of the largest ever energy trade deals for piped gas supplies from Russia to China and the significant volumes of LNG being exported from Australia to the major East Asian economies,

it is possible that east African LNG exports could be sold under contract to European consumers and/or on the global spot market.

The real prize for east Africa would be to find substantial quantities of economically viable reserves of oil, which is both more valuable than natural gas and cheaper to commoditise as seaborne exports. Substantial crude deposits would put east Africa on a par with the Gulf of Guinea as a petroleum production and export region, and completely reshape the petroleum geopolitics and exploration and production development of the region. It would also add another crude oil tanker vein to the strategic petroleum streams across the Indian Ocean, with the greatest volumes navigating north-eastwards to India and eastwards to the Malacca Strait.

Export terminals and shipping

From the perspective of the economic security of the producer countries in this space and the energy security of the major consuming powers in Asia (in particular China, Japan and India), there is no more important single factor than the unimpeded export of crude oil from Iran, Iraq, Kuwait, Saudi Arabia and UAE.

There are a large number of oil terminals within the Persian Gulf and the Arabian Peninsula that export approximately 18 million barrels of oil per day. UAE with 11 terminals has the most, followed in succession by Iran and Saudi Arabia with six each, and then Qatar, Kuwait, Oman, Yemen and lastly, Iraq. However, it is when examining differentials in output that the relative importance of certain terminals becomes clear, the associated importance of the sovereign territorial waters that give access to them, and the relevant significance of the host country as a source of crude oil.

Saudi Aramco's terminals handle more than 3000 tanker loadings per year. The company's terminals are located at Ras Tanura and Ju'aymah on the Arabian Gulf coast and at Jiddah, Rabigh, Jaizan, Yanbu' al Bahr (Yanbu) and Duba on the Red Sea. However, it is the significant dominance of Ras Tanura and Ju'aymah in terms of loading and export capacity that sets them apart. The two terminals alone account for over 32 per cent of total crude exports by sea from the region, and almost 90 per cent of Saudi Arabia's annual exports of crude oil. This pivotal concentration of export capacity renders these terminals the two single-most important crude oil export facilities in the world. In 2014, average global consumption of oil stood at approximately 92 million barrels of oil per day, representing an average annual consumption of some 33.58 billion barrels.[12] Of this, Ras Tanura and Ju'aymah alone account for some 1.477 billion barrels, or 4.4 per cent.

If Saudi Arabia is the cornerstone of oil supplies to the global market due to the scale of its daily output, then Ras Tanura and Ju'aymah are quite obviously the linchpins of its export infrastructure. As much as 80 per cent of the approximately

9.8 million barrels of oil produced by Saudi Aramco every day is piped from fields such as Ghawar to the processing facility at Abqaiq, which feeds processed crude to the massive tank farms and refinery at Ras Tanura.[13] VLCC and ULCC bound for the major refineries in China, Japan, Republic of Korea, India, Singapore, Europe and the United States load approximately 1.3 billion barrels of oil each year at Ras Tanura and Ju'aymah.[14] These facilities are thus *de facto* still the most vital single terminals for the crude oil supply-security for the major importing states in the Indo-Pacific region. Were the terminals to be put out of commission, the impact upon the region and the wider global oil market would be severe in the extreme as the pipeline capacity within Saudi Arabia is currently insufficient to divert the terminals' output to its primary Red Sea terminal at Yanbu.

Kharg Island in Iran, Jebel Dhanna terminal in UAE, and Kuwait's Mina al Ahmadi constitute the second tier output terminals in the region with a combined export output representing 28.11 per cent of the region's total. Though Saudi Arabia's maritime export capacity tends to overshadow that of other regional producers, it can quickly be seen that even if the total maritime export capacity of Iran, UAE and Kuwait individually were to be compromised, the effect on dependent countries and the market-volume/price dynamic would be considerable. Oman's Mina al Fahal terminal is an important facility for geographical reasons. Though Oman's crude output will decline faster in real terms than the other main producers, it is currently the only high-capacity crude terminal in the Arabian Sea located outside of the geopolitical flashpoint of the Strait of Hormuz. Table 3 illustrates the top ten terminals in the region in order by export capacity. Their combined output represents 37.5 per cent of global total export capacity.

Ranking	Terminal	Country
1	Ras Tanura	Saudi Arabia
2	Ju'aymah	Saudi Arabia
3	Kharg Island	Iran
4	Jebel Dhanna	UAE
5	Mina al Ahmadi	Kuwait
6	Zirku Island	UAE
7	Mina al Fahal	Oman
8	Das Island	UAE
9	Al Basra Oil Terminal	Iraq
10	Ras al Khafji	Saudi Arabia

Table 3: Primary export terminals in the Persian Gulf and Arabian Peninsula[15]

Persian Gulf/Arabian Peninsula Crude Exports 2013	Values
Total annual exports	822.89 million tons
Total annual exports	6.083 billion barrels
Average barrels exported per day	16.67 million
Total number of tankers through Strait of Hormuz (SOH) each year	3,835
Average number of tankers through SOH per 24 hrs	10.5 (11)

Table 4: Aggregate export volume and tanker shipping movements[16]

In June 2012, the 1.5 million barrels per day, 360km-long Abu Dhabi Crude Oil Pipeline became operational; enabling the conveyance of UAE crude from the processing plant and storage terminal at Habshan to Fujairah in the Gulf of Oman. The purpose of the line is to reduce dependence on the Strait of Hormuz in the event shipping security was compromised. Therefore, alongside the Saudi terminals in the Red Sea, Mina al Fahal and Fujairah would become vital to regional export capacity in the event access to the Strait of Hormuz was threatened or denied by a geopolitical or asymmetric security crisis.

Lastly, the Al Basra Oil Terminal in Iraq - the country's main maritime export facility, which became the most closely protected terminal in the world following the unsuccessful terrorist strike against both Iraqi terminals, by an Al Qaeda in Iraq cell in April 2004, will become the focus of expanded regional export capacity in the coming years as Iraq begins the gradual process of expanding its daily crude production. It is intended that export capacity from the Iraqi terminals will be significantly boosted in order to accommodate increased production capacity from Iraq's major southern oil fields; specifically, north and south Rumaila, west Qurna and Zubair between 2010 and 2016. These terminals will render Basra a major regional petroleum gateway once production has expanded significantly; thereby necessitating the maintenance of a robust littoral security zone in the northern Gulf region.

Ras Laffan Industrial City's primary purpose is the production, storage and export of LNG, and to a lesser extent, the production of gas-to-liquid petroleum products using natural gas as feedstock. In March 2007, Qatar solidified its status as the largest single source of export LNG in the world. Its importance to the energy security of several states in both Asia and increasingly some in the Atlantic Basin is difficult to overstate. Physically and in terms of location, Ras Laffan's geopolitical significance is further enhanced due to two main factors: the scale of Qatar's gas supply and its geographical location.

Qatar's North Dome gas field is part of a larger structure - the South Pars/North Dome gas condensate field, which is shared between Iran and Qatar. The structure is the largest single gas field in the world. South Pars (which is located in Iranian

waters) is the northern part of the structure, with the North Dome located to the south in Qatari waters. With reserves in place equivalent to some 360 billion barrels of oil equivalent, the field is the Earth's biggest single hydrocarbon accumulation; larger than the world's largest oil field, Ghawar, in Saudi Arabia. The gas reserve estimates for the Qatari section stand at 900tcf of recoverable gas, equating to virtually 99 per cent of Qatar's proven reserves and 14 per cent of global total proven gas reserves.[17]

Aside from the scale of the source gas, Qatar's strategic location in between the major markets in the Atlantic Basin and those in Asia means Ras Laffan is ideally placed to supply LNG carriers steaming east or west. However, with the exception of India, the most important markets in both hemispheres lie considerable distances from Qatar, and are on the other side of several vulnerable chokepoints, notably the Strait of Hormuz, the Suez Canal and the Malacca Strait.

By way of a concluding overview of the Indian Ocean region's importance as a source and exporter of LNG, Table 5 reveals the relative contribution of various key terminals and source countries viewed in terms of numbers of sailings per year; primarily to markets in Japan, China, Republic of Korea and India. Though Ras Laffan is clearly the largest and most strategically vital single terminal in the region with over a thousand sailings of LNG carriers per year, Australia's aggregate sailings to key Asian markets during the last 12 months was 357; placing it in a convincing second place in terms of strategic source importance for the Indo-Pacific region. Combined, all these terminals export 55.9 per cent of global LNG transported by sea.[18]

Furthermore, it is estimated that Australia's export volume is set to expand by over three times from its current level of 24 million tonnes per year to over 80 million tonnes before the end of this decade, thus making the country the number one exporter in region over Qatar.[19]

LNG sailings per year		
Country	**Terminal**	**No of carrier sailings per year**
Qatar	Ras Laffan	1022
Australia	Dampier	240
Oman	Qalhat Terminal	132
UAE	Das Island	87
Australia	Pluto LNG Terminal	60
Australia	Darwin	57

Table 5: LNG sailings per year[20]

Strategic petroleum streams

Though this paper is nominally concerned with maritime activity in the Indian Ocean, when examining the concept of strategic petroleum streams, it is more geographically useful and geopolitically intuitive to consider them on a wider Indo-Pacific canvas. Intrinsic to the ontology of petroleum supply and trade and its security on an inter-oceanic and intercontinental level, are the maritime synapses and conduits that connect sites or nodes of oil and gas export activity with areas of consumption; these are known as sea lines of communication and chokepoints.

The term 'sea lines of communication' is a military concept and thus can be seen to have more strategic connotations rather than commercial shipping ones. However, interestingly, it is this strategic nuance that is employed increasingly in the literature with reference to petroleum movements by sea. This is because oil is seen by national security officials, scholars of strategic and security studies, and military officers as an essential strategic commodity, and in times of war or international crisis the security of vital supplies of petroleum have been facilitated by military power. With this in mind, I have adapted the concept of sea lines of communication to reflect some of the strategic and geopolitical nuances explicit and implicit in the conveyance of oil and gas by sea, which I term: strategic petroleum streams.

Merchant vessels navigating in a sea lane, or crude tankers (VLCC/ULCC), product tankers and gas carriers (LNG/LPG) navigating along a strategic petroleum stream, can navigate freely in international waters under rights afforded shipping under the terms of the *United Nations Convention on the Law of the Sea 1982* (LOSC).[21] In a normative sense thus, merchant vessels should be free from all threats to their security; threats from the effects of land-based interstate war or insurgency, terrorism, and piracy and armed robbery at sea. However, this is often not the case in practice and, as history informs us, conventions of international law are certainly no guarantee of security. Attacks on shipping were strategically 'legitimised' in the world wars of the 20th century and during the 1980-88 Iran-Iraq War as merchant vessels were used to supply vital war materiel, fuel and food. Frankly stated, in any future war in the region, merchant shipping in a strategic petroleum stream would be threatened again, regardless of international law.

However, in more recent times terrorists have attacked ships at sea (in the Gulf of Aden, in the Strait of Hormuz and in The Philippines archipelago), and piracy attacks, hijackings and armed robbery have threatened merchant vessels in the northern Indian Ocean and to a lesser extent in Southeast Asia. Furthermore, within the Indo-Pacific region, strategic petroleum streams pass through or close to disputed maritime areas that have precipitated clashes and raise geopolitical tensions, such as the Spratly Islands, and near states that are experiencing conflict and/or insecurity, such as Somalia, Yemen and Iraq.

Conflicts, insecurity, inter-state tensions; geopolitical flashpoints, crime, piracy and threats of terrorism affect the majority of the primary and secondary strategic petroleum streams in the Indo-Pacific region in differing ways and with varying degrees of intensity. Arguably, the most prominent and important maritime/terrestrial geopolitical features in the context of the maritime conveyance of petroleum are chokepoints, which are also key features of sea lines of communication/strategic petroleum streams because of the potential and actual constraints they can impose on the movement of petroleum, as tankers and gas carrier streams move through them.

Within the Indo-Pacific context there are five strategic petroleum streams:

1. Westward: from the Persian Gulf and Arabian Peninsula towards the Atlantic Basin/maritime Europe market via the Suez Canal
2. South-eastward: from the Persian Gulf and Arabian Peninsula to Southeast Asia via the Malacca Strait
3. North-eastward: from Singapore to Northeast Asia and north-western Pacific rim via the South China Sea
4. South-westward: from the Persian Gulf and Arabian Peninsula to the Atlantic Basin/maritime Europe via Cape of Good Hope; used by VLCC and ULCC heading to the Gulf of Mexico or in the event of a closure of the Suez Canal or adverse security concerns in the Gulf of Aden or Red Sea
5. Northern: from the Western Australian coast to Northeast Asia and the north-western Pacific rim, via the Lombok Strait, Makassar Strait, Celebes Sea and Sulu Sea and The Philippine archipelago.

Intrinsic to strategic petroleum streams are several vital chokepoints that both form part of their routing and connect them. Much has been written on chokepoints and their form and strategic relevance is well documented and understood. For this reason, there is no need to examine them in detail here except to highlight that due to obvious geographical realities, chokepoints tend invariably to be the most vulnerable segments of strategic petroleum streams from a security threat perspective in both a conventional conflict sense and particularly when considering asymmetric threat; most notably maritime terrorist threats, which will be highlighted later in the paper. Table 6 summarises four key chokepoints in the context of petroleum conveyance.

Chokepoint	Alternative Routes	Volume of crude oil per year million tonnes (mt)	Approximate number of tankers per year (average oil tanker is 160,000 DWT)
Suez Canal	Additional 6000nm transit via Cape of Good Hope for tankers; some oil can be diverted through Sumed pipeline	~ 1.64 billion barrels (223,738,063mt) Sumed: 2.5m b/d	1398
Bab el-Mandeb	Additional 6000nm transit via Cape of Good Hope	~ 1.2 billion barrels (164,324,693mt)	1027
Strait of Hormuz	Some oil can be diverted via Petroline from Abqaiq to Yanbu and via Abu Dhabi Crude Oil Pipeline	~ 6.12 billion barrels (834,924,966mt) Abu Dhabi Crude Oil Pipeline: 1.5m b/d	5218
Malacca Strait	VLCC/ULCC must re-route via Lombok Strait; smaller ships can transit via nearer Sunda Strait	~ 5.5 billion barrels (750,341,064mt)	4690

Table 6: Strategic chokepoints[22]

Strategic refining hubs and 'petroleum gateways'

Changes in the long-established global patterns of crude oil transportation, once thought to be a fixed phenomenon, are being recast as a result of the significant expansion of refining capacity at key locations in the Indian Ocean. This development has significantly altered the patterns of petroleum trade in the Indo-Pacific. Aside from changing the make-up of tanker types connecting points of production and consumption, and altering the relative volumes of the kinds of 'oil on the water' to be found along strategic petroleum streams, this changed situation has also given rise to the establishment of strategic refining hubs and petroleum gateways in the Indian Ocean. These facilities have now developed into industrial and trading nodes with inter-oceanic, world-scale relevance. Figure 2 illustrates the pattern of oil product and distillate streams radiating out into the Indo-Pacific from the Abqaiq/Ras Tanura/Jubail refining aggregation, Jamnagar and Singapore.

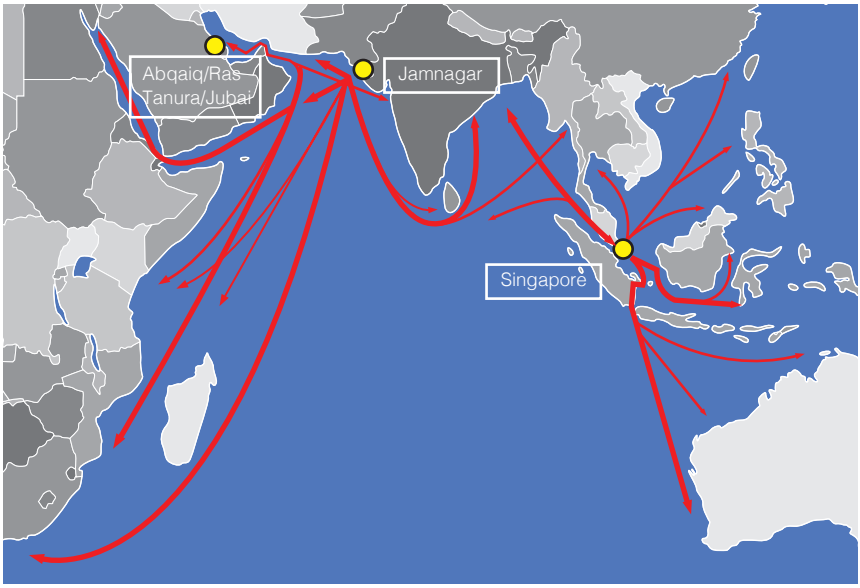

Figure 2: The 'big three' strategic refining hubs and petroleum gateways in the Indian Ocean

The progressive increase in the product tanker fleet, particularly the larger variants, has been driven by the increasing emphasis in international trade of refined products and distillates from major refining complexes to those countries in parts of Africa and Asia with limited or no refining capacities. Large product tankers, with the capability to convey a wide range of different products, function effectively as a 'petroleum lifeline' for some states and very distant sub-regional storage and distribution facilities. This has been the case for major refineries in Saudi Arabia and Singapore and, increasingly, the export-configured refineries in India. Saudi Aramco's refining complex at Jubail on its Persian Gulf coast and Reliance Industries' massive refinery at Jamnagar in India (currently the largest single-site refinery in the world) can be defined as strategic refining hubs, whilst Singapore is arguably the world's optimum example of a petroleum gateway.

Location	Refineries	Total capacity (barrels/ day)
Singapore	ExxonMobil Jurong Island [605,000 bpd] Shell Pulau Bukom [458,000 bpd] SRC Jurong Island [285,000 bpd]	1,348,000
Ras Tanura/Jubail	Saudi Aramco [550,000 bpd] Saudi Aramco/Total [400,000 bpd] Saudi Aramco/Shell [305,000 bpd]	1,255,000
Jamnagar	Reliance Industries [1,240,000 bpd]	1,240,000

Table 7: Refinery capacity

The primary requirement of a strategic refining hub is massive production capacity, supported by vast storage capacity, and the means for simultaneous multiple-vessel loadings. The hub must be in a secured space and located in country with stable international trading relationships. A petroleum gateway, however, is a somewhat more unique phenomenon in the global oil and gas industrial landscape.

A strategic petroleum gateway derives its status from eight key factors:

1. exceptional political stability and levels of national security
2. strategic location at an oceanic trading crossroads (Malacca Strait)
3. the scale of its VLCC and product tanker discharging and loading terminals
4. massive refining throughput
5. vast oil storage capacity (crude, distillates and petrochemicals)
6. natural gas storage and trading capacity
7. the existence of an international financial and petroleum trading market
8. a region-wide tanker distribution network for distillates and petrochemicals.

Singapore is arguably the best example of the confluence of petroleum processing, mass oil storage (including crude, distillates and petrochemicals), tanker loading capacity, trading distribution coverage and ideal geo-strategic location. Simply put, Singapore is the most vital petroleum hub in the Indian Ocean region and Southeast Asia. With over 70 production and storage companies, Jurong Island is now recognised as one of the world's major oil and petrochemical nodes, and the site of one of the world's top three refining centres, after Rotterdam and Houston. Singapore is also the third largest oil trading centre in the world, after New York and London. In order to maintain is status as an international oil and

gas processing and shipping nexus, a massive oil storage expansion project is now well on its way to completion, and the country is about to authorise the development of a second LNG receiving terminal as part of its drive to become Asia's principal LNG trading hub.[23]

Singapore remains the world's most important single waypoint in the maritime conveyance of crude oil. In 2002, the continuous stream of VLCC transiting via Singapore from the Indian Ocean to the South China Sea en route to China, Japan and Republic of Korea equated to over 11 million barrels of oil passing through the strait each day (some 32 per cent of total global oil trade). This volume could reach as high as 24 million barrels of oil per day (37 per cent of the global oil trade) by 2030. VLCC transport up to 80 per cent of China's annual crude imports via the Malacca and Singapore straits.[24]

Viewed cartographically, the pattern of product and chemical tanker trade conveying the fuels and petrochemical products listed above appears as a series of spokes radiating out from Singapore along sea lanes through much of the Indo-Pacific region to many of the major petroleum-capable ports and terminals. Tankers link the refineries and terminals in Singapore with product and distillate-configured oil discharging terminals in Australia, Bangladesh, Brunei, China, east Africa, Hong Kong, India, Indonesia, Japan, Malaysia, Pakistan, The Philippines, South Africa, Sri Lanka, Taiwan, Thailand and Vietnam.[25] Many of these countries, including Australia, are heavily dependent upon Singapore as a source of all grades of distillates and petrochemicals. However, Singapore's petroleum geopolitical reach extends even further than the tanker network's already considerable coverage due to the electronic trading of crude oil and refined products between traders all over Asia that is based in this global financial hub. This extraterritorial 'virtual trading' enables Singapore to also influence those petroleum markets that it is not connected to physically by strategic petroleum streams, tankers and gas carriers.

The importance of Singapore, Ras Tanura/Jubail and Jamnagar to the region cannot be overstated, and the fact that their security is commensurate to their strategic value is abundantly clear. Concisely put, the security of these facilities cannot be allowed to be compromised.

Challenges to Ensuring the Security of the Petroleum Energy System

In order to demonstrate the scale and complexity of the challenges facing states to ensure the security of the petroleum energy system outlined above, this paper identifies six main examples, or facets, by way of explanation.

First, the petroleum energy system is multidimensional, both geographically and typographically. Whilst the vital concentrations of production and export of

crude oil and LNG inside the Persian Gulf are afforded long-standing and highly capable means of naval security and airborne surveillance, other developing E, D & P projects are located in sovereign territorial waters or exclusive economic zones with insufficient maritime security capacity. When assessing infrastructure (or target) typology, different oil and gas exploration and production systems and sites have varying levels of practical vulnerability to attack by asymmetric threat; such as terrorist cells or insurgent forces. Trends reveal that unsurprisingly it is the accessible, less-well protected infrastructure that are and will be threatened more regularly, and that more distantly-located and comparatively inaccessible sites and equipment are far less vulnerable to attack. Nevertheless, as the number and 'visibility' of infrastructure - such as mobile offshore drilling units (such as drill-ships and semi-submersible platforms), gravity rigs, offshore support vessels, offshore production units, tankers, floating production storage and off-loading units, and coastal terminals - in emerging elevated-threat E, D & P areas increases, so too will the likelihood that such features could be targeted in the future. Nevertheless, inevitably, it will be vital for oil companies and host states to continue to risk assess infrastructure in a given area so as to skilfully assign finite security resources.

Second, there is a very wide geographical dispersal of petroleum industry activity in the Indian Ocean, which makes providing even risk-assessed wide-spread security cover problematic to provide, much less ensure. It is impossible for even the largest regional navy to provide the endemic patrolling and response coverage that they might want to. The large distances between and dispersed nature of E, D & P operations create considerable challenges in terms of navies (including coalitions) being able to offer sufficient density of security cover, and also have implications for extended reaction times in cases of unforeseen attacks or threat spikes. Within the context of petroleum sector shipping and logistical support, the supply route distances in the Indian Ocean are clearly very large and in some cases have been highly problematic to secure. The escalating piracy and vessel hijacking threat from Somali pirates in the northern Indian Ocean from 2007 to 2012 proved this conclusively.

Third, some emerging world-class oil and gas source and production regions do not have adequate coastguard and/or naval resources to ensure coastal and offshore security in their territorial waters, and in particular their exclusive economic zones. Examples of sovereign territorial waters and exclusive economic zone maritime spaces where the levels of state security for developing and future offshore activity (including associated shipping support) are limited to varying extents include: Bangladesh, Comoros, Kenya, Madagascar, Mozambique, Myanmar, Oman, Seychelles, Somalia, Tanzania and Yemen. Security capacity is wholly insufficient in Comoros, Madagascar, Myanmar, Seychelles and Yemen. Without increased international state-to-state support for some of these countries, in particular the small island developing states, and in some cases from contracted

private-sector security service support, many of the aforementioned countries would not be able to provide sufficient security for exploration and production activities in their coastal and littoral zones in the event of a surprise attack, a threat-level spike, or a sustained period of elevated threat. Overall, in particular for many states in the emerging oil and gas producing regions, the capacity for full-spectrum security is simply not available.

Fourth, there is an eclectic, and in some cases unpredictable, range of extant and possible conventional and asymmetric threats to security. There are five that stand out as the most significant: piracy, hijacking and armed robbery at sea; terrorist and extremist action; intrastate conflict or insurgency effect at sea; interstate conflict; and, natural forces (or disasters). Due to the distinct differences in their objectives, scale, operational and kinetic manifestation, likely effects, and the nature of the actors or forces involved, each of these requires different types and levels of response. Specifically, piracy, hijacking and armed robbery at sea is a criminal problem as well as a potential strategic threat to tankers, gas carriers and offshore support shipping in strategic petroleum streams, which necessitates a complex and judicious combination of constabulary and naval responses.

There exist varying potential threats to maritime and coastal (shore-side) targets from the following terrorist or extremist groups (the countries where they pose a threat is in parentheses): Al Qaeda in the Arabian Peninsula (Yemen); Ansar Bait al-Maqdis (Egypt); Lashkar e-Tayyiba (India); Al-Mourabitoun (Sahel); and, Islamic State of Iraq and the Levant (Iraq and Syria). These groups have differing levels of reach and capability and thus require different levels of response, military and police capacity and type. For some states, the level of threat far outstrips their capacity to suppress it; particularly in Yemen, Iraq and Somalia. Furthermore, one of the key means of containing and neutralising terrorist threat is timely intelligence, which remains problematic to share between states, notwithstanding the ongoing need to do so.

Insurgents or competing forces in an intrastate context, such as the multiple Libyan militia groups, pose a kinetic threat to coastal petroleum infrastructure and shipping, whilst they also seek to control it as a means of political leverage and/or revenue generation. This kind of threat has proven to be exceptionally complex to manage, much less neutralise. As numerous intrastate conflicts have demonstrated, it is highly problematic for external powers to intervene effectively in terms of net benefit, or sometimes at all to protect their interests, including petroleum ones. Iraq is an excellent example of this.

Interstate conflicts, and the potential threat they can pose to the petroleum sector in the Indian Ocean region, or elsewhere, are fortunately rare. However, the Iran-Iraq War (1980-88) graphically demonstrated how the oil and gas sector - on the coast, offshore, and in the shipping lanes - can be targeted for both strategic and

operational-level effect. This level of threat requires considerable state resources to deter or counter, and can very likely precipitate substantial international concern and operational response.

Lastly, the threat of a natural weather or seismic phenomena in the Indian Ocean upon coastal and in particular offshore oil production infrastructure could be catastrophic, in terms of the potential for an accident resulting in large-scale pollution at sea. Any meaningful response to a large-scale and sustained discharge of oil from a subsea well in the event of the destruction of a production platform would necessitate a multi-national and coordinated containment and clean-up operation.

Fifth, maritime territorial disputes; especially in exclusive economic zones can be both the cause of insecurity to offshore installations and the vessels that service them, and also reveal problems of division of responsibility for security and search and rescue coverage. Disputes, and in some cases open conflict, over maritime spaces where existing and/or future oil and gas exploration and production activity and conveyance could be effected in the Indo-Pacific exist in the following areas: the Persian Gulf (between UAE and Iran); east Africa (between Kenya and Somalia); the northern Bay of Bengal (between India, Bangladesh and Myanmar); the South China Sea (variously between China, The Philippines, Vietnam, Malaysia, Taiwan and Brunei); the Arabian Sea (between Indian and Pakistan and between India and Sri Lanka); and the East China Sea (between China and Japan). These territorial disputes have been, and continue to be, exceptionally challenging to manage, much less resolve. The various confluences of differing interpretations of LOSC, differentials in comparative or relative state power and influence, inconclusive initial territorial demarcation; and in some cases growing volumes of proven reserves and production yield potential, will result in what I term 'petroleum geopolitical flashpoints'.

Sixth, there are well-known challenges in developing multidimensional, interstate collective security missions in the absence of formalised and inclusive alliance structures in the region. In some cases, these challenges could be considerable, even if, paradoxically, both or all of the states involved were impacted collectively. There is wide acknowledgement from experts and commentators of the paucity of stable and widely-inclusive multilateral regimes, security alliances and partnership agreements between states in the region. It is important to acknowledge that this does not mean that regional states do not come together to collectively address security threats - they have and do. The international effort to challenge Somali piracy in the Gulf of Aden and the Horn of Africa is an obvious and important example of this. However, these are not permanent or particularly formalised cooperative projects. As more parts of the region become increasingly larger, and more important, producers of oil and gas and draw in increasing volumes of

associated shipping support, the likely need for multilateral cooperation to secure these spaces will increase. This is particularly so for the emerging production regions in east Africa, as identified earlier.

Recommendations for Potential Initiatives to Improve Sector Security

The following are recommendations for action in six areas that could contribute to the enhancing of security of the petroleum energy system in the Indian Ocean region. Several or all of these will likely have been proposed and studied in some form or another by others at various times; however, there is always benefit in restating and emphasising areas of likely beneficial practical action. The recommendations have been selected on the basis of greater plausibility, given the considerable challenges of cooperative action in a part of the world with well-known competing and/or conflicting interstate relations, and a lack of a codified regional alliances or multilateral architectures.

First, establish which forum, perhaps the Indian Ocean Rim Association, is best placed to lead in furthering deeper understanding of petroleum sector security requirements; particularly for the emerging producing regions in east Africa, small island developing states in the region, and the Bay of Bengal.

Second, build upon the work and fast growing legitimacy achieved by the Indian Ocean Naval Symposium to study and promote mechanisms for established and more formalised partnerships to ensure practical steps to enhance maritime security as it pertains to the oil and gas sector and shipping. A component of this could be to develop a thorough regional sector security risk analysis study that could inform national strategies where appropriate, and identify requirements for risk management, so as to optimise targeting of threats and resource allocation. Emphasis should be applied to the critical strategic-level infrastructure, features and locations, specifically: the primary crude oil and LNG loading terminals; strategic refining hubs; and potential threat and vulnerability convergences (the Somali Basin, the Yemeni coast and littoral, the north-eastern Arabian Sea, northern Persian Gulf, and the Bay of Bengal).

Third, include participation and draw upon the expertise of the shipping industry, oil and gas sector, and private security companies in developing deeper understanding of the vulnerabilities of specific infrastructure and installations. This will also give rise to a better appreciation of the calculated consequences of successful attacks against different targets, which will inform as to optimum forms of emergency response.

Fourth, encourage those states with territorial disputes that also have proven and probable reserves within them and those where the industry has identified

promising hydrocarbon-bearing geology, to seek out means of dispute settlement. Such accords might be sought on the basis of fostering exploration and production sharing projects and consortiums that bring together international oil companies.

Fifth, promote the concept, understanding and means of attaining improved maritime domain awareness in littoral spaces and exclusive economic zones where it is currently insufficient and cannot be implemented by the nominally responsible riparian states. This could perhaps be initiated in the western Indian Ocean where production and export of natural gas (and potentially oil) will begin before the end of the decade. Such a process could eventually result in materiel and training assistance for the coastal states in the form of unmanned aerial vehicles (UAV), coastal radar stations, command and control apparatus, and coordinated coastguard patrols to significantly boost the maritime security capacity in this space. The implementation of UAV/maritime patrol aircraft/radar coverage in the Gulf of Aden, based upon example of the MALSINDO and 'Eyes-in-the-sky' project in the Malacca Strait, could also serve as a potent threat deterrent and monitoring means now that there has been a reduction in the number of coalition warships in this vital part of the east-west-east strategic petroleum stream.

Sixth, seek out knowledge and assistance from industry experts in oil-spill emergencies and response as to the likely resource requirements needed to contain and roll back a major offshore oil spill. Prioritisation should be given to emerging production areas that are distant from the Persian Gulf (where response resources are well established and more plentiful) and in particular where production will be in deep and ultra-deep water blocks, which vastly complicates spill containment from deep, high pressure wells as evidenced by the Deepwater Horizon disaster in 2010.

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Issues Facing the International Shipping Industry

Llew Russell

I would like to congratulate the Royal Australian Navy for organising this seminar with a theme that is so important to the individual economies within the region. Protecting our ability to trade requires an understanding of what challenges are currently being faced by the shipping industry in the Indian Ocean region and what are the major influences on the capacity of the industry to maintain efficient and productive services. These influences involve supply and demand factors as they impact on individual segments of our industry, the cost of environmental regulation, the increasing size of ships and the lack of port infrastructure to adequately cater for them as well as the inevitable congestion issues that will arise if not more attention is paid to addressing deficiencies in our logistical operations. I will not only concentrate on international trends that will impact on our region, although such impacts could be felt differently in different trade lanes but also on issues within the Australian context that could also be applicable or be adapted for use by our neighbours.

This is an important region with annually, two-thirds of the world's seaborne trade in oil, 50 per cent of the world's seaborne container traffic, one-third of the world's seaborne bulk cargo and the world's highest tonnage in the seaborne transportation of goods, reportedly involving some 100,000 ships (including vessels below 500GT), transiting through the Indian Ocean and its adjacent waterways.[1]

To summarise the international shipping outlook, I can do no better than quote the President of the Baltic and International Maritime Council (BIMCO), John Denholm when, at the end of last year, he forecast possible developments in 2014:

> It is estimated that across the bulk carrier, container and tanker fleets there is over 20 per cent more tonnage than required. The over-supply is aggravated by very high bunker prices; on the one hand this is forcing slow steaming that is absorbing some of the over-supply; on the other hand it is driving the desire for more energy efficient ships. As a result, a worrying amount of ordering is taking place, adding tonnage to an already excessive world fleet.
>
> The ever increasing regulatory requirements impose significant costs on our industry at a time when it can ill afford them… We must stop allowing regulation to be developed without prior completion of a broad technical, environmental and economic impact assessment. Recently, the International Maritime Organization (IMO) has shown itself to be pragmatic with its request for a fuel oil availability study by 2018 and a more realistic timetable for the fitting of (on-board) ballast water treatment systems.[2]

One bright spot in this gloomy outlook is the liquefied natural gas (LNG) shipping sector with a 10 per cent annual growth rate in demand for LNG over the past decade. In 2009, charter rates dropped to $30,000 a day whereas in 2012 they peaked at $150,000 per day before dropping back to the $80,000 to $85,000 range which is expected to be maintained over the next 5 years or so.[3]

Naturally we pay close attention to forecasts of world trade growth and the International Monetary Fund expects the 2014 global gross domestic product (GDP) and world import volume growth to hit a three-year high at 3.6 and 4.8 per cent respectively which is encouraging as is the expectation that growth in emerging markets and developing economies will remain strong at 5.1 per cent in 2014.[4] However excessive ordering of new vessels and low scrapping/idling rates could apply a brake on earnings in some sectors. The OECD has noted that world trade, as a percentage of global GDP, is no longer following the same progressive trend as in the past. In the 1990s world trade stood at 15 per cent of GDP, in 1998 at 20 per cent and in 2006 at 25 per cent of GDP and increased to 26 per cent by 2009 but it has stayed at that percentage since. If this trend is maintained long term this could have serious ramifications for shipping.[5]

Shipping Industry Trends

A study by Ocean Shipping Consultants on global LNG trade and trends to 2030, forecast a rise in world LNG demand to over 570 billion cubic metres (bcm) by 2020 from the estimated 310bcm today and to over 880bcm in 2030 which would require an increase in the LNG fleet of 170 per cent. This would require an increase in the fleet from the approximate 360 vessels today to 900.[6] In October 2013, the Australian Minister for Industry, the Hon Ian Macfarlane predicted that Australia will shortly become the second largest, or optimistically, the largest exporter of LNG.[7] Whether that prediction is fulfilled remains to be seen but certainly Australia will be among the leaders. Interestingly the Malaysian International Shipping Corporation which has withdrawn from container and dry bulk shipping in recent years reportedly has the second largest fleet of LNG tankers in the world.

BIMCO expects dry bulk demand to grow at 4.5 to 6 per cent in 2014. There was a significant recovery in Capesize time charter rates (6 month deals) in September 2013 reflecting strong demand and lower fleet growth in 2013 but this was short lived. Both Supramax and Handysize vessels have enjoyed better earnings in the last 12 months although the 1 and 3 year time charter rates have barely moved. It is interesting to note that the Baltic Dry Index fell 11 per cent between October and December 2013.[8]

Very Large Crude Carriers (VLCC) enjoyed an unexpected rally in freight rates in the final quarter of 2013 but it had been a difficult year prior to that recovery. Fleet growth in the crude oil tanker segment was expected to reach 2.3 per cent in 2013

with around 15 VLCC/Suezmax vessels still to be delivered in 2014. There is an expected growth in demand for product tankers despite expected fleet growth in 2014. Early this year BIMCO expected the rates for both VLCC and Suezmax vessels to soften with rates for Aframax vessels to remain more or less unchanged.[9]

Whilst there have been a few successful general rate increases in the major trade lanes on the basis of deployed tonnage being balanced with demand, most have been unsuccessful. Nevertheless, the highest demand is being seen in the smaller trades, especially the north-south trades with bright prospects in terms of ASEAN economic activity in 2014. Regrettably there are still signs that the market has reached saturation point, for example, spot freight rates in the Asia-to-Australia trade lane fell 65 per cent last year. In 2014, forecast supply growth of 7.4 per cent is set against global demand growth of only 4.3 per cent. A total of 61 vessels of an average 13,556 TEU are due for delivery this year.[10]

There has been some success with scrapping of vessels, being younger and larger than before. The average age of vessels scrapped in 2013 was 23 years with a capacity of 2286 TEU compared to 24 years and a capacity of 1868 TEU in 2012. Over the period 2005 to 2009 the average age of vessels scrapped was 29 years.[11] This trend is expected to continue. Some shipping lines such as Maersk Line have been surrendering some of their 300 chartered vessels earlier than the contracts allow with the agreement of the owners.

In 2013, new orders totalled 1.69 million TEU (cf 0.4 million on 2012) with 52 per cent of the new capacity contracted being Ultra Large Container Vessels (≥10,000 TEU), 35 per cent being in the range of 8000-9999 TEU, leaving only 13 per cent for vessels below 8000 TEU (and able to use the Panama Canal).[12] In 2013 Maersk took delivery of its first 18,000 TEU vessel (triple E class) part of a 20 vessel order and the United Arab Shipping Company has ordered five 18,400 TEU vessels with an option for another. Many major container shipping companies are ordering Ultra Large Container Vessels. Smaller container vessels will cascade down into the lower volume trades, especially the north-south trades.

Clearly, the size of container vessels, in particular, is increasing rapidly but also the size of cruise vessels. The largest is currently the RCCL vessel *Oasis of the Seas* at 225,000GT with capacity for 8000 passengers and crew. There are other cruise vessels being built even larger which raises serious concerns should a search and rescue mission be required. Australia has a search and rescue area covering 10 per cent of the world's oceans. The largest cruise vessel that visits Australia from time to time is the 152,000GT *Queen Mary 2*.

Container vessels currently employed in the Australian trades are up to just under 6000 TEU but this size of vessel can be expected to increase quite rapidly in the relatively near future to around 6000-8000 TEU even if the higher end of this range cannot be fully used because of draught constraints in our major container ports.

An increasing number of Capesize dry bulk carriers can be expected to visit Australia in the coming years, especially in north-west Australia and increasingly we will witness VLCC transferring oil 200-300nm offshore onto smaller vessels that can more easily discharge in Australian ports.

Environment

> The cost to the industry of these new regulations is mind boggling, particularly when seen in the perspective of an industry striving to recover from the effects of the great recession and operating in a market of oversupply of ships, high volatility in freight rates and exorbitant fuel prices.[13]

Nevertheless, the industry is striving to meet its environmental challenges and has been doing so for some time. As mentioned earlier, the average age of vessels in the world fleet is declining and there has been a significant reduction in major oil spills since the 1970s, as one example. Whilst shipping has the lowest CO_2 emissions of any mode of transport, in terms of grams per tonne-kilometre, it is recognised that more can be done and the industry is aiming for a 20 per cent reduction in existing levels of greenhouse gas emissions by 2020 and 50 per cent by 2050.

The convention requiring all vessels to have IMO-approved onboard ballast water treatment systems is expected to enter into force shortly. Whilst the schedule for introduction of such systems on the approximate 50,000 large commercial vessels around the world has been amended by the IMO and is considered more realistic, it could still be difficult to meet installation timing requirements.

The current global limit for sulphur in heavy fuel oil is 3.5 per cent but this will be reduced to 0.5 per cent sulphur in 2020. The global production capacity of these so-called middle distillates is limited and a big question is whether refiners will increase their capacity to produce the required volume. This is the basis of the IMO fuel oil availability study which is scheduled for completion in 2018. If there is insufficient capacity, it will drive up the price not only for shipping but also consumers across the world.[14]

There are other problems with low sulphur fuel. An investigation by the UK P&I Club showed that compliance with low sulphur fuel regulations (such as in the emissions controlled areas) has exacerbated ever increasing incidences of main engine failures and electrical blackouts. In 2011, the US Coast Guard issued a maritime safety alert in an effort to 'increase awareness and reiterate general guidance on fuel systems and fuel switching safety' to prevent propulsion losses.[15]

The search for alternative ship propulsion fuels continues and the leading contender is LNG but again there are problems. Jesper Aagesen from Lloyd's Register stated in *Horizon*

> LNG's potential to reduce CO_2 emissions is doubtful. The combination of methane escape during extraction and methane slip during combustion as well as the overall energy needs of the LNG supply chain need to be further investigated to adequately claim that LNG can reduce greenhouse gas emissions on a like for like comparison with heavy fuel oil.[16]

This is indeed a timely warning.

An interesting alternative could be coal processed on land to manufacture methanol which could be loaded onto ships for use as a fuel, even if only required nearing land, for example, as it has several advantages over LNG.[17] One downside, could be a the amount of space required to store it on board compared to current bunker tanks but this is also a problem for non-LNG tankers seeking to use LNG as a fuel.

An Australian Case Study

I would like to outline a number of initiatives that have been taken in Australia which could be of interest to other countries in this region.

In 2012, there was agreement between the Australian government and state/territory governments on a national ports strategy (as ports remain the responsibility of state/territory governments even though a number have been privatised). The ambitious plan recommended reserved land/sea access and corridors with transparent and long-term fixed buffers around port areas, a 30-year planned national ports system fully integrated with urban and jurisdictional plans and importantly shortened approval times for expansion and new infrastructure. It also covered the easing of obtaining infrastructure funding, simplified port planning and improved productivity.[18]

Improved sea traffic systems are presently available and being progressed. For example the Australian Maritime Safety Authority (AMSA), the Australian Hydrographic Service, and Western Australia's Department of Transport have worked together to establish a network of shipping fairways off the north-west coast of Australia, as shown in Figure 1.

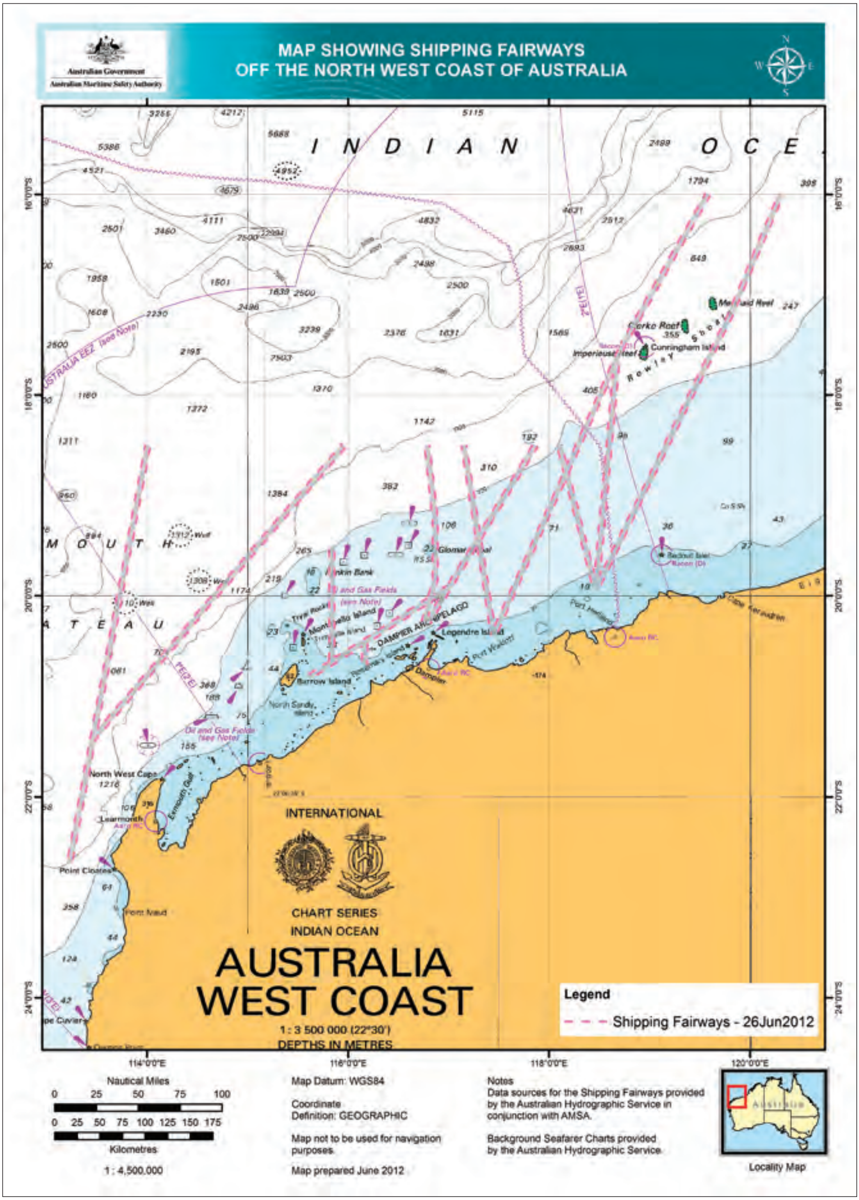

Figure 1: North west coast shipping fairways

The new fairways aim to reduce the risk of collision between transiting ships and offshore infrastructure. They are intended to direct large ships in the area into pre-defined routes to keep them clear of existing and planned offshore infrastructure.

They are similar to the Dampier Shipping Fairway which was charted in 2007 and it has proved to be successful in achieving its aims. Whilst use of the new fairways is strongly recommended, they are not mandatory and their use does not give vessels any special right of way.[19]

Throughout the world there a number of projects looking at what might be possible in vessel tracking, route monitoring and planning. One of the most interesting to me is the MONALISA project which commenced in 2010. The initial phase of the project covered dynamic and proactive route planning, electronic verification of officers' certificates, ensuring the quality of hydrographic data and global sharing of maritime data.[20] This project is ongoing and could well result in sea highways, at least in congested areas. These initiatives will complement the relatively new electronic charts navigation system currently being introduced on all vessels in accordance with international agreement at the IMO.

In other initiatives, a package of legislative measures was introduced in 2012 in an ambitious attempt to revitalise Australian shipping. The objective was to introduce equitable regulatory and fiscal arrangements compared to those that generally apply to foreign flag vessels in their country of registration. The package included significant changes to the current taxation regime that applies to Australian-flagged vessels, a new regulatory regime applying to coastal shipping and the introduction of a separate Australian International Shipping Register where only two senior officers, preferably the master and chief engineer were required to be Australian citizens. The Productivity Commission in its report into shipping serving Tasmania recommended a complete review of the current coastal shipping regime to determine if a cabotage regime can continue to be justified.[21] Shipping Australia Ltd was critical of some aspects of the new coastal shipping laws and it will be interesting to see how this issue develops in the future.

The rewrite of the 100-year old *Navigation Act 1912*, which included making AMSA the sole regulator of all commercial vessels in Australia, was another important reform. The ratification of the *Maritime Labour Convention 2006* by Australia will do much to improve the welfare of seafarers visiting our shores. The recommendations in the new freight strategies that have been introduced in Queensland, New South Wales and Victoria, if implemented, will do much to avoid port congestion in the future, simply because of our inability to cope with increasing cargo volumes on the landside.

The Development of a Maritime School of Strategic Thought

Vice Admiral Ray Griggs has suggested that consideration be given to a maritime school of strategic thought for Australia. In his view,

> this way of thinking strategically must recognise the increased pervasiveness of maritime trade and our national dependence on it for our on-going prosperity, which will give the Australian Defence Force (ADF) a central role in a critical national mission- the protection of our ability to trade- the very thing that underpins our national prosperity and security.

I could not agree more because the central focus of shipping policy is to facilitate trade and the protection of our ability to trade is central to that debate. The Chief of Army, General David Morrison, stated recently

> Professor Michael Evans has described Australia as a maritime nation with a continental culture and has analysed the narrative of the Australian settlement and the degree to which we define ourselves as a sun burnt country…. The history of maritime strategic thought in Australia is like the study of snakes in Ireland: there are no snakes in Ireland.[22]

The primary focus of the ADF is clearly enhancing defence capability and efficiently performing the tasks set by the Australian government whereas the primary focus of industry is productivity and competitiveness to deliver sustained long term growth in revenue for shareholders. Whilst this is an oversimplification, it also points to the area of common interests which should grow with the development of maritime strategic thought.

One specific area of common interest in developing such a strategy that comes to mind could be an investigation into the building in Australia of two roll-on/roll-off vessels that could be provided to private interests to operate and fully maintain in the coastal container/break bulk trade between say Sydney, Melbourne and Fremantle but with extra accommodation for training seafarers, strengthened decks for armoured vehicles and earth moving equipment etc, as well as a helicopter landing pad. With two weeks' notice the vessels would be available for ADF use in specified circumstances including humanitarian relief in Australia and in our region. Regular coastal shippers' interests would need to be protected under any such arrangement in relation to service and freight rates. However, this would allow Australian flag vessels to more readily complete with road and rail transport on this trade route as no capital to service would reduce the disadvantage of the stevedoring costs. Is this just one of those potential areas of common interest?

Conclusion

Internationally, the shipping outlook for the Indian Ocean region is similar to other areas but impacts could differ in individual countries. The outlook is not greatly optimistic for the shipping industry except it is brighter in terms of prospects for some individual segments such as the carriage of LNG, product tankers, car carriers and cruise vessels. Volume-wise, most major container trade lanes are not expecting significant growth except intra-Asia. However, the general consensus appears to be that 2014 could well turn out better than 2013. Vessels are rapidly increasing in size, primarily in the LNG, container and cruise markets. This will cause cascading down of the smaller vessels into this region and countries in the north-south trades. Whist smaller in terms of the Ultra Large Container Vessels currently being built and delivered, vessels of 6000-8000 TEU will be a challenge for our ports and current landside logistics systems.

Environmental issues and current timetables internationally for their introduction remain a serious concern for the shipping industry. The search for a fuel source to replace heavy fuel oil continues and this will be a major focus of interest for the industry in the years to come. New technology will undoubtedly play an important part in the eventual solution.

Turning to more local issues that could be of interest to regional countries, reference has been made to the national ports strategy introduced in 2012 but it will be interesting to see if the recommendations are implemented in full. Of particular interest is the improved traffic systems introduced by AMSA, especially the network of shipping fairways off the north-west coast of Western Australia. There are a number of interesting projects world-wide investigating new vessel tracking, route monitoring and planning systems.

In other initiatives, reference was made to the legislation aimed at revitalising Australian shipping but it remains to be seen if the objectives will be achieved. Some aspects of the new coastal shipping regulations have drawn criticism from industry and it is hoped amendments will be introduced by the new Australian government. Other reforms include a complete re-write of the Navigation Act 2012 and the introduction in Australia of the new *Maritime Labour Convention 2006*.

The Chief of Navy has suggested consideration be given to a maritime school of strategic thought in Australia and this concept has received broad support. There is a need to expand the area of common interests between the ADF and the maritime industry and developing strategic maritime thought in Australia will go a long way towards achieving that objective. Such a strategy will need to be fully aware of what is happening world-wide and in regions such as the Indian Ocean region. This type of seminar is an important step in that direction.

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Implementing the ISPS Code in the Indian Ocean Region

Chris Trelawny

The International Maritime Organization (IMO) is the United Nations specialised agency with responsibility for the safety, security and efficiency of shipping and the prevention of marine pollution by ships. As a truly global industry with many stakeholders, shipping benefits from harmonisation of procedures, adoption of common minimum standards and clarity with respect to national legal regimes. This is the core of IMO work. The focus is on the development of technical standards and regulation through consensus and IMO decisions reflect the collective will of the 170 member states. The IMO *raison d'être* is the safety of life at sea - and it has just marked the 100th anniversary of the first International Convention for the Safety of Life at Sea (SOLAS), adopted on 20 January 1914.

To navies, the key pillars of a comprehensive maritime security strategy are probably the combination of maritime security operations, maritime situational awareness and maritime capacity building - all dynamic and active concepts. However, for the civil maritime sector, maritime security is more of a state of existence than a dynamic process and the approach is therefore somewhat different.

The statistics are well known: 90 per cent of trade goes by sea, carried on some 54,800 cargo carrying ships totalling 1017 million GT; and a complex web of national interests: flag state, ownership, beneficial ownership, cargo owners, nationality of masters, officers and crew (often different), insurance, class and so on. For the shipping industry, perhaps maritime security means the ability for merchant ships to 'pass on the seas upon their lawful occasions', serving global trade and free from interference from terrorists, pirates, armed robbers and those who would unnecessarily impede international maritime traffic, including bureaucrats and over-zealous regulators, rather than an active mission to suppress wrongdoing - after all, that is what the shipping industry believes that navies are for.

The International Legal Framework

In the 'good old days', maritime security was so much easier. The naval balance ensured the status quo and the focus was on protecting merchant ships from pirates, armed robbers and other criminals. Customary international law, as articulated in the *United Nations Convention on the Law of the Sea 1982* (LOSC), outlawed piracy, slavery and illegal broadcasting and provided an adequate framework in international law upon which to base domestic legislation. IMO guidance to governments and to the industry focused on avoidance of problems

and self-protection through preventative security and threat transfer, supported by good policing ashore and a maritime law enforcement presence, both civil and military, at sea.

Terrorist attacks on ships, outside of civil wars and the actions of groups such as the Liberation Tigers of Tamil Eelam 'Sea Tigers', were mercifully rare however, incidents such as the hijacking of the MV *Achille Lauro* in October 1985 did give rise to further international instruments to plug the gaps in LOSC: the *Convention on the Suppression of Unlawful Acts against the Safety of Maritime Navigation 1988*, and its protocol on fixed platforms on the continental shelf (SUA Convention), currently with 162 and 150 states parties, respectively.[1] At around that time the 1988 Vienna Convention on drugs and, in particular, Article 17 on 'illicit traffic by sea' added further building blocks of international law upon which to build national maritime law enforcement regimes.[2] In order to complement these legal instruments, IMO developed practical guidance on maritime security, the prevention of drug smuggling and the prevention of stowaways.

Incidents such as the boarding and subsequent release of the MV *So San* and its cargo of missiles in December 2002, gave rise to further changes to the international maritime security regime.[3] The *So San* incident served as a catalyst for a number of initiatives - the 2003 Proliferation Security Initiative (PSI), now supported by over 100 states and well known to navies; United Nations Security Council Resolution 1540 (2004); and, from an IMO viewpoint, the 2005 amendments to SUA Convention.

The SUA 2005 amendments are consistent with both PSI and Resolution 1540. Currently, 29 states representing 36 per cent of world tonnage have acceded to the revised Convention, and 25 to the 2005 Protocol.[4] The revised Convention defines new offences in its Article 3 *bis*: terrorism offenses on board or against ships or platforms; non-proliferation offenses; transporting terrorist fugitives; and threats, conspiracy and attempts to so. In this context 'transport' is defined as 'initiating, arranging or exercising control, including decision-making authority, over the movement of a person or item', which could have major implications for supply chain security regimes.

More interesting from a naval viewpoint are the boarding provisions introduced in Article 8 *bis*, under which a requesting state can request authorisation from the flag state to stop and board a ship outside of the territorial sea and to take appropriate measures. The basis for such a request is having reasonable grounds for believing that an offence under the revised SUA Convention has been, is being, or is about to be, committed. The Convention also details a number of safeguards in the system, to prevent its misuse and to protect the interests of legitimate merchant shipping.

The revised SUA Convention forms maritime layers within a wider United Nations counter-terrorism strategy that is currently based upon 16 international counter-terrorism legal instruments. Essentially, their main focus is on the maritime aspects of effective border control. To this end, the IMO Secretariat actively participates in the work of the United Nations Security Council's counter terrorism executive directorate and the United Nations General Assembly's counter terrorism implementation task force.

The maritime security measures introduced by the IMO through the amendments to SOLAS and the *International Ship and Port Facility Security Code* (ISPS Code) complement the SUA Convention and should therefore be seen as a part of an on-going and much wider initiative against maritime terrorism. The measures are focused on what the civil maritime industry can do to assist governments to counter terrorism, rather than being a stand-alone solution to maritime terrorism.

Development of the ISPS Code

The events of 11 September 2001 and other terrorist 'spectaculars' at around that time changed the way that merchant shipping was perceived. The inherent stability of the Cold War has given way to a less ordered world where the threat posed by rogue (or at least less well-disposed) states and transnational actors operating from ungoverned spaces, became the key concerns. Essentially, the previous focus on the protection *of* merchant shipping shifted to the protection of states *from* merchant shipping, or at least the cargoes that they carried.

Following the 2001 terrorist attacks, the IMO Assembly called for a review of the existing international legal and technical measures to prevent and suppress terrorist acts against ships at sea and in port, and to improve security aboard and ashore.[5] The aim was to reduce risks to passengers, crews and port personnel onboard ships and in port areas; to protect vessels and their cargoes; to enhance ship and port security; and avert shipping from becoming a target of international terrorism.

Although the 'normal' procedure would have been to develop a new international convention to address the new threats, the IMO member states chose a somewhat more pragmatic approach and elected to revise an existing instrument, SOLAS. This was a logical step. The *Achille Lauro* incident took place in October 1985. The resulting SUA Convention was developed by a diplomatic conference held in Rome in March 1988 and went into force in 15 states in March 1992, six and a half years after the event. By contrast, following the 2001 terrorist attacks, the diplomatic conference held at the London headquarters of IMO in December 2002 (the 2002 SOLAS Conference) adopted a number of amendments to SOLAS, the most far-reaching of which enshrined the new ISPS Code, which went into force in 147 states on 1 July 2004.[6] (There are now 162 SOLAS contracting states).

The amendments to SOLAS comprised the development of a new chapter XI-2 on 'Special measures to enhance maritime security' and the introduction of the ISPS Code. These consolidated and added to all of the previous IMO guidance on security, prevention of drug smuggling, stowaways, and port state control regimes. Essentially these 'special measures to enhance maritime security' were about reassuring the port states that the ships entering their waters did not pose a threat; and reassuring flag states that the ships flying their flag would be protected while in other states' ports and territorial waters.

Using SOLAS as the vehicle for measures to enhance maritime security has had some interesting implications. SOLAS addresses the safety of life at sea and thus provides jurisdictional challenges ashore where, in reality, most of the preventative security measures are applied. This is particularly true with respect to containerised cargo, storage of prepared cargoes and access control measures. A number of approaches were adopted to address these issues. The definition of 'port facility' was left to SOLAS contracting governments to determine - it is important to remember that SOLAS and the ISPS Code are written as treaty law for interpretation by contracting governments, as appropriate - thus giving flexibility in how far inland the maritime security regime could be enforced.[7]

Following the 2002 SOLAS Conference, IMO cooperated with the International Labour Organization to develop a *Code of practice on security in ports* which effectively extended the ISPS Code into the wider port area.[8] Similar cooperation with the World Customs Organization on the security of closed cargo transport units led to the development and adoption in June 2005 of the SAFE Framework of Standards to Secure and Facilitate Global Trade.[9]

Implementation of Maritime Security Measures

As with the maritime safety-related provisions of SOLAS and other IMO international legal instruments, the responsibility for implementation of maritime security measures onboard ships lies primarily with the flag state. In simple terms, the flag state's Administration, usually the maritime authority or coastguard agency, is responsible for ensuring that ships entitled to fly the country's flag obey the rules. In the context of maritime security, this includes ensuring that ship security plans and effective standard operating procedures specific to the ship are developed and implemented; that suitably qualified ship security officers are appointed; that all crewmembers are trained to the required standard; and that plans and procedures are kept current and relevant through regular drills and exercises.

Governments are also responsible for assessing the threat to ships flying their flag and determining the appropriate security level for that ship. An increase in security level should trigger the implementation of a series of pre-determined and approved measures in accordance with the ship's security program; a decrease in security level should lead to a reduction in their implementation.

Towards effective implementation of security measures

IMO itself has no policing or enforcement mandate. There is no formal procedure for IMO to censure flag states that do not comply with their obligations under the various maritime conventions. However, that is not to say that there are no effective methods of 'encouraging' compliance - the maritime industry is a commercial enterprise, in many ways the compliance mechanisms play to that fact.

On the high seas, that is in areas outside of the jurisdiction of any state, the law of the flag state applies and the implementation of IMO conventions is the responsibility of the flag states. However, when ships enter waters under the jurisdiction of coastal and port states, in general terms those ships become subject to the laws of the coastal and port states concerned. Clearly, coastal and port states have an interest in preventing loss of life, pollution, environmental damage, illicit activity etc within their sovereign space and thus are entitled to establish a degree of control.

States have the right to control any activities within their own borders, including those of visiting ships. In terms of maritime safety, security and protection of the marine environment, states are entitled to inspect foreign ships visiting their own ports to ensure that internationally agreed standards are met and that any deficiencies, including those concerning living conditions and the safety of ship staff, are rectified before the ship is allowed to proceed. For maritime safety and environmental protection matters, this is referred to as port state control. Port state control inspections for safety and environmental reasons are generally conducted by civilian maritime safety agencies and are technical in nature.

The framers of SOLAS chapter XI-2 and the ISPS Code also envisaged the need for a similar approach to be taken for maritime security. Recognising that national agencies responsible for maritime security were more likely to be coming from military, intelligence or law enforcement agencies rather than civilian agencies, the term 'control and compliance' was adopted for what is essentially security-related port state control. The legal basis for this is detailed in SOLAS regulation XI-2/9 on control and compliance, and IMO has developed a range of guidance on how to implement such measures.[10]

Regional cooperation

As shipping is a global industry and the elimination of sub-standard shipping is in the interests of all parties, a number of mechanisms for international cooperation have evolved to enhance the effectiveness of port state control. As no one state can inspect all ships, groups of states have agreed to share information on ships inspected and deficiencies identified with a view to providing more effective coverage over a wider geographical area. Ships identified as being compliant in one port need not be re-inspected in other ports; however, those found to be deficient are likely to be further inspected in other ports.

Traditionally, these agreements have been formalised through the signature of a memorandum of understanding (MoU). The Indian Ocean MoU came into effect on 1 April 1999 as an agreement between Australia, Eritrea, India, Sudan, South Africa and Tanzania. It has continued to evolve and currently 17 countries have become parties to it.[11] These effective systems for regional cooperation could be readily adapted as vehicles to enhance maritime security.

The economic driver to compliance is generally compelling - as witnessed by the reduction in the number of accidents, oil spills or other incidents at sea over the last few years - years that have seen an increase in the size of the maritime sector. Shipowners operate ships in order to make money. Shipowners may choose the state of registry for their ships and will generally do so in a way that maintains their competitive advantage. A flag state's revenue depends on the number of ships registered. However, a flag that develops a reputation for not enforcing adequate standards will see ships flying that flag being subject to increased scrutiny by port state control authorities, with subsequent delays on ship movements. Ships not moving do not make money and so owners of compliant ships may elect to re-flag, thus reducing the revenue to non-diligent flag administrations. Again, this logic can also be applied to maritime security control and compliance measures.

Port facility security

In terms of the implementation of SOLAS chapter XI-2 and the ISPS Code, it would be fair to say that the main area of weakness is port facilities. Unlike on ships, where an existing safety culture was relatively easy to evolve, the security structure in ports is generally far more complex involving many players from different governmental, law enforcement and private entities. Many countries view ports as critical infrastructure and their security as a facet of national security. However, without clear national and local legislation, policies and direction coordinating the activities of all key stakeholders, security responses in port facilities are, at best, fragmented.

Critical to the success of port facility security regimes, be they for protecting port infrastructure against terrorist attack, countering theft and other criminal activity, or preventing access to ships by terrorists, drug smugglers or stowaways, is a well-coordinated, risk based preventive strategy. Although IMO has no mandate to assess the compliance of port facilities with SOLAS chapter XI-2 and the ISPS Code *per se*, it is readily apparent that the absence of port and port facility security committees is an indicator of poor port facility security. The active promotion of such coordination mechanisms, consistent with the ILO/IMO *Code of practice on security in ports* and other guidance issue by IMO, forms the cornerstone of its work on promoting better compliance with SOLAS chapter XI-2 and the ISPS Code.[12]

Protection of Ships at Sea

Protection of ships at sea is largely addressed either in the context of countering piracy or through the reassuring presence of naval forces in conflict zones or areas of high political tension, particularly in the vicinity of major chokepoints through which significant proportions of the world's trade and energy needs are carried by merchant ships.

The naval efforts to suppress piracy in the western Indian Ocean have been deeply appreciated by the merchant shipping community. Whereas it is a truism that piracy is a symptom of wider, land-based problems and will never be solved at sea, the potential for naval forces and coastguards, acting in a law enforcement capacity, can have a significant effect. This was proved in the Asia-Pacific region, most notably in the Malacca and Singapore straits by tripartite cooperation between Indonesia, Malaysia and Singapore and the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) initiative; is being demonstrated again in respect of Somalia-based piracy; and is also showing some positive results in the Gulf of Guinea.

In the case of the western Indian Ocean, civil/military cooperation to counter piracy is well established. Companies intending to operate ships in the high risk area are strongly advised to pre-register with the Maritime Security Centre - Horn of Africa (MSC-HOA), run by the European Union Naval Force (EUNAVFOR), so that a vulnerability assessment can be carried out and more effort be given to vulnerable ships. Ships entering the area are then expected to apply IMO guidance and the best management practices (BMP) for self-protection; reporting to the UK Maritime Trade Operation in Dubai (run by Reservists from the Royal Navy) so that they can be better assisted; follow the Internationally Recommended Transit Corridor either in a group transit or as part of a national convoy; and improve their own situational awareness by listening out for warnings from UKMTO, NATO Shipping Centre, EUNAVFOR, the IMO regional Information Sharing Centres, or national naval authorities. The naval forces, supported in part by long-range

identification and tracking of ships data, have also been effective in encouraging better uptake of BMP through 'naming and shaming' those not complying. The coordination of naval forces and government vessels is achieved through the Shared Awareness and Deconfliction (SHADE) process - an operational level forum bringing together Combined Maritime Forces, NATO, EUNAVFOR and states independently participating in counter-piracy operations in the region, such as China and the Russian Federation. This coordination and proactive action by naval forces to disrupt pirate action groups, both at sea and ashore, has been very effective. However, neither the 'tyranny of distance' - the sheer size of the area to be patrolled - nor the challenges to navies acting in constabulary roles should be underestimated. Anybody who has spent time listening to legal experts revealing the shortfalls in national counter-piracy legislation and its inability to meet LOSC obligations, and worrying over respect for pirates' human rights, can understand the pragmatic wisdom of the navies' 'catch and release' policy.

It is important not get sidetracked by the debate on whose responsibility it is to protect merchant shipping from pirates and the whole 'arms on board' debate. The important issue is the protection of global maritime traffic upon which the world economy depends. National interests are far wider than the flag that the ship happens to be flying and in a global economy, as well as in LOSC articles, all states have an obligation to suppress piracy.

The Future of Maritime Security

Looking ahead, there is a clear need to continue to gain and maintain better maritime situational awareness. Better use of SOLAS-mandated automatic identification system and long-range identification and tracking data; the lessons identified and learned by MSC-HOA, UKMTO and other naval operations (which will hopefully be passed on to the regional Djibouti Code of Conduct information sharing centres, the imminent Maritime Trade Information Sharing Centre in Accra, Ghana, the evolving Regional Anti-Piracy Prosecutions and Intelligence Co-ordination Centre in Seychelles and other such centres); and better interagency cooperation, will enhance regional capacity to develop situational awareness. This, coupled with the development of robust legal frameworks and the capability to patrol, deter, interdict and enforce national law will enhance the contributions of regional states to global maritime security. The more coastal states in the region can do to protect their territorial waters and exclusive economic zones, the less the burden on international naval forces to protect global trade.

However, there does seem to be an almost existential crisis about 'what are navies for'? Politically, there does not seem to be much evidence of grand strategic thought and planning - certainly many states are hampered by 'government by accountant', a lack of joined up thinking, and dealing with the 'here and now' rather

than longer term solutions. At a time of increasing instability in the Middle East and what appears to be a potential naval arms race in the Asia-Pacific region, the need for navies to maintain the deterrent capability of their high-end warfighting skills remains critical. However, in these times of pressure on budgets and resulting inter-Service rivalries there can be a natural tendency to focus on the navy as an independent service and the survival of the naval role in its current form as an end in itself. It is worth remembering that, whereas an army is basically a kinetic weapon system (occasionally to be fired at coastlines by the navy), navies are so much more than that - they are essentially diplomatic tools of government with the capability to project power and influence globally. Their ability to deliver kinetic effect, although essential, is secondary to that purpose.

The question really should be what does the 'whole of government' want to do in the maritime context and in the wider security context and how can the navy support that? This of course requires joined up thinking and forward planning, both of which are sadly lacking in the political machinations of liberal democracies where economies are in tatters and the attention span is until the next election.

But given that the focus is on countering the threat posed by rogue (or at least less well-disposed) states and transnational actors operating from ungoverned spaces, perhaps the sustainable solution would be to assist less developed states to overcome their 'sea blindness' and to focus on developing national 'maritime business plans' supported by national maritime security strategies and maritime law enforcement capability in its widest sense.

The focus should be on developing national capacity to perform what are sometimes referred to as 'coastguard functions', and what the French Marine Nationale refers to as *L'action de l'Etat en mer*, that is those tasks mandated by the various international conventions to which states have committed themselves, and then to establish an integrated network so that they can be applied regionally. These coastguard functions include the development of states' search and rescue capabilities; the prevention of pollution and protection of the marine environment; maritime and energy supply security; and countering piracy and armed robbery against ships, illegal migration and the trafficking of drugs, weapons and people. Such a system could also play a major role in states' efforts to unlock the potential of their exclusive economic zones and to develop and maintain viable fishing industries, thus contributing to sustainable development, consistent with the United Nations millennium development goals.

It is therefore important to take a strategic, long-term view and to interpret the enhancement of maritime security as a building block for greater stability on land, making fullest use of navies as a diplomatic asset within a comprehensive strategy.

Navies can help in a variety of ways. The diplomatic value of navies is a key enabler in this process. Not only are navies good at capacity building (when they are allowed to be) they are also very effective at opening doors and ensuring high-level engagement politically. Visits by warships and senior naval officers are a good vehicle for raising the profile of maritime issues to the highest levels of government. These can then be followed up by continued contact through the use of Defence Attaché networks, especially where forward-leaning states employ naval officers and marines in these roles rather than perpetuating the land based dominance by army officers.

Ship visits, including programs such as the multinational Africa Partnership Station or port calls by warships engaged in counter-piracy in the western Indian Ocean, taking national law enforcement detachments to sea, can also provide useful demonstrations of the potential benefits of national maritime law enforcement capabilities and 'top down' as well as 'bottom up' training.

However, sustainable programs using small, embedded teams of land-based naval and marine personnel to deliver initial training, and to train and mentor national trainers on a continuous basis, are an effective way of developing national maritime capabilities, as well as being significantly cheaper than visits by warships. The development of the Yemeni Coast Guard is a good example of this. This should not be looked upon simply as aid; rather it should be considered as conflict prevention and invested in accordingly.

In summary, the key pillars of a comprehensive maritime security strategy are the combination of full and effective implementation of SOLAS chapter XI-2 and the ISPS Code, using navies to develop states capacity to conduct their own maritime security operations, further developing national and regional maritime situational awareness, including challenging sea blindness, and maritime capacity building with a focus on constabulary operations. In this context, navies can be a force for good and naval staffs could influence their respective governments to take timely and positive action to enhance maritime security in its widest sense.

NOTES

1 As at 10 February 2014.

2 *United Nations Convention against Illicit Traffic in Narcotic Drugs and Psychotropic Substances, 1988*.

3 For flag verification pursuant to LOSC Article 110.

4 As at 10 February 2014.

5 IMO Assembly resolution A.924(22), November 2001.

6 The Conference of Contracting Governments to the International Convention for the Safety of Life at Sea, 1974, 9-13 December 2002, London.

7 SOLAS regulation XI-2/1.1.9: 'Port facility is a location, as determined by the Contracting Government or by the Designated Authority, where the ship/port interface takes place. This includes areas such as anchorages, waiting berths and approaches from seaward, as appropriate'.

8 See International Maritime Organization, 'ILO/IMO Code of practice on security in ports', 'www.imo.org/OurWork/Security/Instruments/Pages/CoP.aspx.

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11 As at September 2013, see www.iomou.org.

12 For example the 'Guide to Maritime Security and the ISPS Code' published by IMO and MSC.1/Circ.1192 on Guidance on voluntary self-assessment by SOLAS Contracting Governments and by port facilities, www.imo.org/OurWork/Security/Guide_to_Maritime_Security/Pages/Guide-to-Maritime-Security.aspx.

Maritime Cooperation in the Indian Ocean

Jane Chan

The term 'Indo-Pacific' has gained traction as a geographical and strategic construct referring to a wider geopolitical perimeter, looking beyond the Asia-Pacific to include the Indian Ocean region. Whilst the term itself is not new, it is only recently that a steady proliferation of literature began contemplating its application in the current strategic environment.[1] Proponents like Raja Mohan see the need to view the Pacific and Indian oceans as connected and use of the wider geopolitical construct helps us understand the role of emerging powers like China and India and their respective spheres of influences.[2] Others remain either sceptical or worry that it will further complicate the current strategic discourse by enmeshing existing troubles of the various sub-regions under one roof.[3] There is no doubt in the mind of this author that the term itself and its utility will continue to be a topic of much scholarly and policy contention.

Against the backdrop of a macro region - the Indo-Pacific - the Indian Ocean region has been a focus of attention due to its political and strategic challenges.[4] The Indian Ocean is both a resource and a conduit fuelling the development of its littoral states and areas further away. It is of particular importance to the growing economies of East Asia. The Indian Ocean region comprises 36 states and hosts some of the world's vital and busiest chokepoints; the Suez Canal, Bab el-Mandeb, Strait of Hormuz, Malacca and Singapore straits, Mozambique Channel, and the Sunda and Lombok straits.[5] These chokepoints link all the major sea lines of communication responsible for 90 per cent of world trade, and two-thirds of the worlds' energy demand.[6] Raw materials and vital commodities that fuel the rise of emerging economies, in particular China and India, and then the manufactured goods from the likes of China, India and some Southeast Asian countries to the rest of the world are carried along these sea lanes.[7]

The Indian Ocean holds an enormous depository of both living and non-living resources, including oil and gas, precious metals and gems, and of course, fish and other seafood. Technological advancement allows marine scientific research to be done in parts of the oceans previously not reached by man, it has enabled fishing vessels to sail further, oil and gas rigs to drill deeper, yet these technologies are not always accessible to all, especially not to the developing countries that can ill afford them. The ability to explore and exploit maritime resources, competition for them led by increasing global demand, and the ability to ensure safety and security in transporting the same resources could be causes for conflict, and at the same time, a source for common and collective actions.

Maritime Security Concerns

The Indian Ocean region has been described as a 'sea of troubles'.[8] It was saddled with the title not simply because of an existing risk of interstate conflict; there are other recognised threats and risks in the maritime domain, which are either not being dealt with, or could be better managed to ensure good order at sea.[9] In particular, non-traditional maritime security challenges such as: piracy and sea robbery; maritime terrorism; illegal, unreported and unregulated (IUU) fishing; trafficking and smuggling of arms, people and drugs; and natural disasters. Energy security, food security and the spread of infectious disease are all major issues with significant maritime dimensions.[10]

Piracy and armed robbery at sea have been persistent problems in the Indian Ocean. While much attention has focused around the Horn of Africa (off the coast of Somalia and the Gulf of Aden), and on the Malacca and Singapore straits for awhile, attacks on ships also occur elsewhere along the east African coast, in Indian ports, and the west African coast. Data from the International Maritime Bureau and the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) Information Sharing Centre shows fewer attacks in 2013 than occurred in 2012. Although the number of attacks in Southeast Asian waters did increase in absolute terms, the level of severity of these attacks was lower, being mainly petty theft. However, there was a marked increase in attacks in Indonesian waters in comparison with the previous four years: 14 in 2009, 37 in 2010, 47 in 2011, 66 in 2012, and 83 in 2013.[11] Most attacks in Southeast Asia targeted vessels at anchor, in port or entering/leaving harbour. These attacks are usually of a minor nature and are best countered by more effective policing by port authorities, including active patrolling of ports and anchorages. In contrast, steaming vessels were often attacked in the Indian Ocean. The *modus operandi* used is also vastly different from that in Southeast Asia, as most of the attacks involved the vessels and crews being kidnapped for ransom, or having the cargo offloaded. The perpetrators operate further offshore, are usually heavily armed and attacks will involve some form of violence.[12] It is impossible for any single navy or maritime enforcement agency to effectively counter this piracy.

The vulnerability of the maritime sector to terrorist attacks is also a concern. The risks include targets at sea, and the use of the sea to support attacks on land. The attacks on the French tanker MV *Limburg* and the American destroyer USS *Cole* occurred in the Indian Ocean. The Mumbai attacks in 2008 demonstrated the vulnerabilities of a porous Indian coast. Key chokepoints such as the Malacca and Singapore straits, Bab el-Mandeb, the Suez Canal and the Strait of Hormuz are all considered vulnerable targets, and a successful attack on any of these key maritime routes will have a devastating effect on global shipping with its impact felt worldwide.

The sea is the preferred transportation medium for the movement of goods in large volumes, but the complex nature of the shipping industry and the volume of trade moved can be exploited to conduct illegal activity, including the trafficking of both goods and people.[13]

Many global fish stocks are assessed as being under major stress due to over-fishing, and IUU fishing is predicted to increase as coastal states seek to impose more stringent conservation regulations to management their fish stocks.[14] Depletion of fish stocks by IUU fishing and degradation of coastal habitats due to climate change and marine pollution in the Indian Ocean also affect the livelihood of coastal populations that traditionally rely on fishing. Losing that main source of income has tempted some into other illegal endeavours, such as piracy and sea robbery in regional waters.

Regional Cooperation

The security of shipping and seaborne trade across the Indian Ocean is a strong common interest for most regional countries, as well as extra-regional stakeholders, particularly Japan, China and the United States. Particular attention is focused on the security and safety of shipping in the major chokepoints in and out of the Indian Ocean: the Strait of Hormuz into the Persian Gulf, the Malacca Strait between the Indian and Pacific oceans, and Bab el-Mandeb into the Red Sea.[15] The detailed security measures required in each strait is different, but in broad terms, cooperation between stakeholder navies is required to ensure the security of regional sea lines of communication. Regional cooperation is fundamental to the maintenance of good order at sea and the security of these sea lanes in the Indian Ocean. But in order to achieve this, more is required than just the efforts of the littoral states or relying solely on the capacity of member states within established institutions.[16]

Non-traditional maritime security threats are of common concern. However, a common threat perception or prioritisation of issues is lacking, which discourages cooperation between Indian Ocean states. Measures to deal with these threats offer a good rationale for engaging regional partners, so that not only will such cooperation and collaboration help mitigate the impact of threats, but also engender trust and confidence.

The need to ensure safety and security of shipping are requirements that could provide the basis for maritime cooperation in the Indian Ocean.[17] Many regional countries have limited capacity to mitigate, much less eradicate, maritime threats. While it is commonsense that only when the regional states come together as one, can existing limited capacity be harnessed to deliver functional and practical solutions to mitigate regional maritime security challenges, it is their implementation that is challenging. Questions include whether regional maritime cooperation

needs be premised upon existing regional security architectures and whether a collective identity is a prerequisite. Can established common interests alone bring regions and sub-regions that are so diverse together?[18]

Multilateral institutions

Unlike the Asia-Pacific, the Indian Ocean region is well behind when it comes to establishing multilateral security regimes. From an Asian perspective, economic and strategic connectivity is most tangible in the maritime domain, reflecting the nature of Asia's maritime geography and the sea's enduring quality as a manoeuvre space. Any disruption, real or threatened, will be a cause for concern. Hence, an observable plethora of multilateral institutions and regimes was established at both the Track I and II levels, with the hope of encouraging regional countries to address different and sometime overlapping matters of regional security concern.

At the Track I level ASEAN, the ASEAN Regional Forum, the Asia-Pacific Economic Cooperation, the ASEAN Deference Ministers Meeting (ADMM) and ADMM-Plus are most prominent. The Council for Security Cooperation in the Asia-Pacific and the Network of ASEAN Defence Institutes are perhaps the most active at the Track II level. The 'plus' processes are worth mentioning as they reflect the region's acknowledgement of the need to positively engage external powers and stakeholders with the region.

While not a security community, ASEAN and its various institutions have established more than ten maritime security-related initiatives to promote regional cooperation. Whilst overlaps exist, it is important that each initiative remains relevant, functional and manageable; to meet current operational needs for maritime domain awareness and as a building block for wider maritime security cooperation.

A region as diverse as the Indian Ocean also needs an overarching mechanism, perhaps similar to those in the Asia-Pacific that promotes and facilitates inter-state interactions. However, the Asia-Pacific model is simply that, a model pieced together to suit the circumstances of the Asia-Pacific. The Indian Ocean region on the other hand, needs to examine and explore institutional structures that will work within its current set of concerns and constrains. The Indian Ocean Rim Association (IORA) and the Indian Ocean Naval Symposium (IONS) are two such initiatives, both concerned with maritime security and with intentions of establishing, to varying degrees, an effective region-wide security regime.

The Indian Ocean Rim - Association for Regional Cooperation (IOR-ARC) was formally launched at its first ministerial meeting in Mauritius in March 1997; and was renamed IORA at the council of ministers meeting in Perth in November 2013, when Australia took over as its Chair. IORA currently has 20 member states, six dialogue partners and two observers.[19] Its objectives are to promote sustainable

growth and balanced development in the region and of its member states and to create common ground for regional economic cooperation. It strives towards building and expanding understanding and mutually beneficial cooperation among the countries in the Indian Ocean region.[20] Despite being touted as having immense potential to facilitate regional cooperation, it has suffered from lacklustre performance over the years, and lost a lot of its initial momentum as a regional mechanism.[21]

Australia's chairmanship has instilled some much needed enthusiasm amongst its members. The November 2013 council meeting led to the very well received Perth Communiqué, which conveyed amongst other priorities, IORA interests to broaden and deepen efforts to bolster maritime safety and security; ensure safety of seafarers; to explore concrete options to enhance counter-piracy cooperation; improve maritime information sharing; improve regional port state control; implement fully their obligations under the *International Convention for the Safety of Life at Sea 1974* and the *International Ship and Port Facility Security Code* through domestic implementation of these instruments. Importantly the communiqué also called for '…IORA's work on maritime security and safety and disaster management align with and complement possible IONS initiatives in these area, including information sharing, and other activities with both civilian and non-civilian dimensions'.[22] Likewise, the 'Perth Principles' adopted by the foreign ministers of the member states also list maritime safety and security as one of the six priority areas of cooperation amongst them.[23]

The Indian Navy initiated IONS in 2008 to promote cooperation between navies, coastguards and marine police in the Indian Ocean region.[24] It has 35 member countries, including all 20 members of IORA (and three IORA dialogue partners: France, Egypt and Japan). It was inspired by and modelled on the Western Pacific Naval Symposium (WPNS) created by the Royal Australian Navy in 1988, to provide a regional mechanism for navies and maritime forces to meet periodically to discuss and interact on matters of common interest and to pursue cooperative engagement and initiatives.[25] The key objective is to bring together regional navies and maritime forces to synergise their collective resources, and to maintain good order at sea in the Indian Ocean.[26]

IONS is a voluntary initiative with membership limited to the Indian Ocean littoral states. Political obstacles exclude some states from participating, while involvement of non-littoral states was eschewed from the beginning.[27] It can only rely on the momentum generated by member states to fuel its ambitions and overcome internal inertia. Following the progress of IONS since its inception shows that the 'Chairmanship' matters. Whilst there are a multitude of common interests, particularly in the maritime domain, not involving extra-regional countries that have major interest and stakes in the region may prove to be a major stumbling block.[28]

Maritime situational awareness

As Geoffrey Till puts it, 'The maintenance of good order at sea requires an improved level of awareness, effective policy and integrated governance'.[29] To operate in such a vast and complex region alongside partners and individual states, it is important to begin with a comprehensive 'common operating picture' of the maritime domain so that all can operate safely and efficiently. Good examples include arrangements for sharing maritime data/information, which are an important contribution to maritime security, both to meet current operational needs for maritime domain awareness and as a building block for wider maritime security cooperation. Knowing what is going on at sea is a pre-requisite for doing something constructive about it.[30]

Singapore has taken the lead in Southeast Asian maritime information sharing by linking its Information Fusion Centre (IFC) at the Changi Command and Control Centre with regional centres. The IFC brings together information from diverse sources (from 64 agencies across 32 countries).[31] Fused information is shared by partner navies and agencies across a network of users, heightening the maritime domain awareness of every network participant. Several Indian Ocean countries, including Australia and India, have posted International Liaison Officers (ILO) to the IFC which currently has 64 of them from 19 countries. Other states in the Indian Ocean should consider posting personnel to the IFC to make use of the information sharing processes to support maritime security efforts in the Indian Ocean.

Regional navies and maritime enforcement agencies know that acquiring a comprehensive picture of the maritime domain, requires more than precise intelligence and 'state of the art' information technological tools. It means engaging with maritime industry encouraging them to share information of potential threats. It means sharing their assessments with the industry so shipmasters and crew are aware of the threat level in the waters they will traverse, and be prepared for any contingency. The IFC, in collaboration with ReCAAP ISC and the UK Hydrographic Office launched a maritime security chart in 2013. Mirroring the format adopted by UKMTO in the north-eastern Indian Ocean, this chart seeks a seamless transition of the voluntary community reporting system by merchant ships from the eastern limits of the Indian Ocean all the way to Hong Kong. Established in December 2008, the Shared Awareness and Deconfliction (SHADE) meeting initiative is used by Combined Maritime Forces to coordinate the efforts of the numerous maritime forces conducting counter-piracy operations in the Indian Ocean.[32] It is a valuable mechanism for tactical and operational commanders to meet with their counterparts to discuss current/planned operations and threat analysis. It also serves as a mechanism for navies to interact with maritime industry to achieve a comprehensive understanding of and approach to maritime safety and security. Engagement with the shipping industry is crucial, as the need to ensure safety

and security of the maritime domain enables the shipping industry to function at its best, allowing countries around the world to trade.

Successful partnership

While many non-Indian Ocean states have significant interests in a stable and secure region, current regional and sub-regional multilateral institutions continue to limit membership to littoral states.[33] Major 'user' states of the Indian Ocean are left out of these processes, particularly China, whose presence in regional waters correlates to its increasing interest in the Indian Ocean. Similarly the preponderant US naval presence is not fully engaged in these processes leading to lukewarm partnerships. While advocates push for other major powers, such as India, China and the European Union to take a leadership role in the region, it will be unwise not to consider regional potential sensitivities as well.[34]

A considerable number of naval and maritime forces operate in the Indian Ocean, but many of these maritime security initiations were put in place by extra-regional countries, which participate in them more than littoral states. As examples, the European Union Naval Force operates under Operation ATALANTA, to counter piracy off the coast of Somalia; and is part of the European Union's common security and defence policy framework, which is also monitoring fishing activities off the coast.[35] Operation OCEAN SHIELD conducted by NATO, is a counter-piracy mission to deter and disrupt pirate attacks, escort vessels and to assist coastal states build their maritime security capabilities.[36] Then there are the USN-led combined task forces (CTF): CTF 150 focuses on countering terrorist acts and related illegal activities, CTF 151 focuses on countering piracy, and CTF 152 focuses on maritime security operations and cooperation.

As the Indian Ocean states work at establishing an effective collective regime to address regional problems, particularly in the maritime domain, they might also consider whether indigenous efforts should and will complement existing initiatives, especially those that involve extra-regional countries. How will these regimes link to other regional institutions with overlapping members, such as those in the Asia-Pacific region?

Final Thoughts

In wanting a regional identity, maritime concerns and interests that are common to all littoral states could be the basis for a more cohesive region. Naval and maritime cooperation could be an enabler for this, creating the opportunity to build trust and confidence.[37] A collective consensus to send more warships into regional waters is probably not what everyone has in mind, and definitely not an ideal solution for regional security concerns. At this nascent stage of creating the foundation for an

effective collective regime, the consensus reached at the IONS conclave of chiefs in March 2014 got it right when recognising the need to focus on establishing a baseline to improve the unity of efforts. This starts with the establishment of a shared and common operating picture of the maritime domain. A working group on information sharing might create a willingness to share information through established means and processes. Issues of interoperability will take longer to resolve, and realistically not before the requisite level of trust and confidence is achieved. Port visits, bilateral and multilateral exercises, personnel exchanges are a good set of activities that will help promote this.

Navies and maritime forces are facing a new and more complex set of issues within the Indian Ocean. How well they can focus on collectively meeting these challenges without being embroiled in existing political and strategic rivalry will affect regional stability and security. Therein lies the challenge: to balance the need to engage with all stakeholders, yet not be trapped in their political and strategic rivalries.

Notes

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Naval Cooperation in a Sea of Anarchy

Jonathan Mead

Of the great oceans in the world, the Indian Ocean stands apart. It is small in size, long seen by some as of lesser importance than its Pacific and Atlantic cousins, but how times have changed. With over 40 per cent of the world's population calling this ocean home, and as power balances have shifted from Europe to the Indo-Pacific, the Indian Ocean is now centre-stage of global geopolitics. What is striking about the Indian Ocean is its diversity; states that adjoin this ocean are differentiated by their varying political ideologies, by the God they pray to, by the language they converse in, by their history and their race.

Despite all this, the 'Indian Ocean world' has one common feature, the sea, which to use a Mahanian expression, forms a 'great highway' bridging together continents and islands. Notwithstanding the heterogeneous nature of the region, and setting aside for one moment the debate over a common set of values, what we do know for sure is that each state that identifies itself as belonging to the Indian Ocean has a direct interest in the ocean and what it delivers.

That said, the ocean that we are dependant upon for our survival and prosperity can, in an instance, also destroy us. In recent years alarm bells have rung loudly, as the region has struggled to deal with a never-ending stream of security challenges. One by one they have come, sometimes trickling in, sometimes in a deluge, and these have ranged from climate change and natural disaster, through to people smuggling, transnational crime and economic security. For many a year, good order at sea was, in a sense, an oxymoron in the Indian Ocean. And the manner by which nations deal with these security challenges is made more difficult by the anarchical nature of the high seas.

In the face of a growing realisation that action was needed, a sister to the Western Pacific Naval Symposium (WPNS) was born in 2008 when naval chiefs of the region came together in New Delhi to form the Indian Ocean Naval Symposium (IONS). Clearly, a central plank to IONS is naval cooperation; the thinking being that the sum is greater than its constituent parts. How naval cooperation may best be progressed is the main theme of this paper; and in order to provide some context, a snapshot of a handful of maritime issues confronting the region might set the scene.

Tragedy of the Commons

In the middle of the Indian Ocean, situated just north of the One and Half Degree Channel, rests the beautiful and tranquil island chain of Maldives; Asia's smallest and least populated nation, it is also the world's lowest lying country. With over 90 per cent of its tax revenue generated by tourism, Male is almost entirely dependant on the sea, or more accurately, the sea-level. Climate change and resultant inundation from rising sea-levels poses the single greatest threat to the security of the Maldivian people.

Every year around May, storm clouds, laden with rain, form in the Arabian Sea. Observed by sailors for thousands of years, this weather phenomenon is the life-force of India's agricultural industry. Strong moist winds strike the southwest Indian coast in early June bringing with it essential rainfall. Gathering strength, the monsoon spreads across the Deccan Plateau and up into the Indo-Gangetic Plain, ending near the Himalayan Ridge. Over half of India's population live off the land and are dependant on the monsoon for the water it brings and the subsequent nourishment of food crops. Nature has, at times, been unkind to the billion or more people calling Hindustan home, as the monsoon infrequently fails to deliver the rain that the plains need so desperately.

On Boxing Day 2004, many miles under the seabed, a tectonic plate near Indonesia slipped. This shift resulted in a tsunami that radiated outwards akin to ripples in a pond. Within hours, over a quarter of a million people perished as powerful waves ripped through coastal villages in Indonesia, Asia, and Africa; all with devastating effect. Tragedy, as it so often does, acts as a rallying cry and in this case the international community moved quickly to assist those states that had lost so much. Rarely does a year go by when we are not confronted by a natural disaster of biblical proportions; Typhoon Haiyan in December 2013 near The Philippines is a case in point.

In street jargon, the expression 'what has that got to do with the price of fish' is a dismissive retort to an irrelevant suggestion. But for many states in the Indian Ocean, the price, supply and protection of fish stocks assumes an importance that many in the world fail to appreciate. Smaller states, with limited capacity to police their waters, are vulnerable to poachers who, whilst violating sovereignty, ravage and sack sea-bed resources. The net result of such wholesale destruction requires a regional approach to ensure the longevity of such a precious commodity.

Around the Horn of Africa the scourge of piracy has plagued mariners. Perhaps the most dangerous waterway in the world, shipping has, until recently, been at the mercy of criminal elements operating from Somalia. Whilst it is universally acknowledged that the solution to this problem can only come through political changes to Somalia itself, coalition efforts to stem the tide of piracy-related

incidents is only treating the symptoms not the problem itself and the fact remains that Somalia, for the sixth year running, has been labelled as number one on The Fund for Peace Failed States Index. For sure an inglorious record, but indicative of the reality that when a country fails it takes significant time and resources for reconstruction to have any meaning. Sadly, piracy is an exportable art, and whilst the Horn of Africa attracts most attention, the waterways in and around the archipelagic states of Southeast Asia have also been hotspots for pirate attacks.

Operating in a similar water space to Somali pirates, but receiving far less media attention, have been the activities of international terrorist organisations using the seas to transport narcotics, weapons and militants from one country to the next. Heroin begins its journey in the poppy fields of Afghanistan, where it is then hauled overland through Baluchistan to the coastline - small skiffs then ferry this product out to awaiting dhows, which then transports millions of dollars in illicit cargo to awaiting criminals abroad. Even more alarming has been the vocal intent of some well known groups such as Al Shabab, Al Qaeda in the Arabian Peninsula, and the Abdullah Azzam Brigade, to attack merchant shipping in the Strait of Hormuz and Bab el-Mandeb. Blessed with a sprinkling of good luck, MV *MStar* which was attacked by a waterborne improvised explosive device in the Strait of Hormuz in 2010, was saved by the fact it only partially detonated.

For centuries, trade was ferried from China westwards across the Central Asian Republics to South Asia and then through to Europe. This path, known as the Silk Road, was notable for its strategic importance as the economies of Europe and the Far East were dependant on the free flow of commodities through the route. Nowadays, matters are reversed. Instead of east to west, the trade moves west to east; oil and liquefied natural gas from the Gulf states have replaced spices as the lifeblood of nations, and the Indian Ocean has become the primary medium of haulage. Every day tankers laden with precious oil navigate their way through the narrow chokepoints of the region. Any disruption to the free flow of oil would have a disastrous impact on the global trading regime.

Many of the issues previously outlined have potential for naval intervention; whilst others are thornier and require global political action (climate change and rising sea-levels are good examples). That said, navies are renowned for their flexibility, adaptability, poise and persistence, and in times of need they are often the first point of call.

Regional Naval Cooperation

Oceans are anarchical. To be specific, no authority has singular sovereignty of the water space. Of late, the expression ‘maritime commons’ has come into vogue, denoting that unlike *terra firma*, the sea once past the 200nm limit is everyone’s responsibility and at the same time no one’s responsibility. Sociologists theorise

that when a resource is held jointly, it is in the individual's (read: state's) interest to exploit rather than protect the asset. The turn of phrase 'tragedy of the commons' was even coined to describe this way of thinking.

It is a home truth that IONS countries are almost totally reliant on the commons as a sea-bridge for trade. Putting aside one moment the issues of climate change, pollution, people smuggling, transnational crime, narco-terrorism, natural disaster, food stocks and energy reserves, the clear fact remains that countries within IONS derive their economic prosperity from and through the ocean.

By way of responding to these dilemmas, 26 chiefs of navy of the littoral states of the Indian Ocean region gathered in New Delhi on 15 February 2008 in order to discuss constructive engagement. Hailed as the first new regional maritime security initiative of the 21st century, the conclave sought to address maritime issues pertaining to the region's security, stability, safety and prosperity. Similar to its political sibling, the Indian Ocean Rim Association (IORA), the progress of IONS initiatives has been tested by the disparate character of the region. Some commentators contend that the Indian Ocean has no distinctive overarching personality. It is true that there is a kaleidoscope of political and non-political structures which cut across the region, many with little connection to the other. When an opportunity arises to bring together some of these institutions, or at the very least introduce a degree of consistency into the region's security architecture, the chance should not be overlooked. Coincidentally, the chair of IORA passed to Australia in late 2013, and with the RAN assuming responsibility for IONS, there has been muted talk about harmonising the two bodies. How we best position the two, whilst IONS is still in its infancy, is the real question.

Over the past six years there has been a temptation to mirror the framework of the WPNS and use this as a template for naval cooperation in the Indian Ocean. Whilst there might be merit in replicating some of what WPNS entails, the history of that construct is very much different to IONS. WPNS was born in the dying years of Cold War mistrust, when identifying a *cause-celebre* in order to bind, then glue disparate nations, was so much easier. Without such an existential threat, and in the absence of a common rallying cry, bringing navies together may require a more sophisticated course of action. Moreover, the geopolitical narratives of WPNS and IONS are hardly similar. In the former, alliances and treaties were very much in fashion (indeed they still have much currency today), but in the Indian Ocean, the region is noted by its climate of non-alignment.

Since the last Conclave of Chiefs in 2012, two themes stand out sharply. First, Indian Ocean states have continued to struggle in a depressed global trading environment, and defence funding has naturally been affected. Cognisant that times are fiscally tough, and austerity is the norm rather than the exception, there clearly are benefits to combining maritime efforts. At the very least it will

reduce duplication. At its best it will manifest in the usage of naval 'best practice'. Second, the Horn of Africa has become a whole lot safer to navigate around. On this point, a combination of factors including the embarkation of armed security teams on transiting ships, the implementation of best management practices by seafarers and the vigorous prosecution of pirate action groups by CTF 151 (Combined Maritime Forces), CTF 465 (European Union), CTF 508 (NATO) and the independent players around the International Recommended Transit Corridor have seen successful pirate attacks drop to zero. The scoreboard now reads: navies 1: bad guys 0.

Local Naval Cooperation

Maritime security, just like other forms of security, is more often than not directly shaped by distance. Put simply, the closer one is to a threat, the hotter it feels. In the same manner, cooperation between states and navies is also affected by distance. Political scientists have coined the term 'security complex' to describe how countries which are clustered together, tend to have interwoven security linkages - what affects one affects others. By looking at the conundrum of regional maritime security through a reductionist lens and by uniting IONS states into small, manageable, and homogenous components, ones that are generally reflective of the security complex they identify with, may offer a pathway for successful naval cooperation. Fortunately, the original architects of IONS nicely divided the grouping into four geographic sub-regions, these being:

- South Asian littorals - Bangladesh, India, Maldives, Pakistan, Seychelles and Sri Lanka
- West Asian littorals - Bahrain, Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates and Yemen
- East African littorals - Comoros, Djibouti, Egypt, Eritrea, France, Kenya, Madagascar, Mauritius, Mozambique, Somalia, South Africa, Sudan and Tanzania
- Southeast Asian and Australian littorals - Australia, Indonesia, Malaysia, Myanmar, Singapore, Thailand and Timor-Leste

Naval cooperation, via military forces, coastguards and police forces, could be based very loosely around these sub-regions as they do offer a host of advantages.

First, the sub-regions bring neighbours together. This is essential, because in times of need most states look to their neighbour as the first point of call for assistance.

Second, the cost of any interaction is reduced. Navies are expensive, if for no other reason but the high cost of fuel and stores which ships burn and consume.

On that note, time, distance and dollars are all proportionally related, and the shorter the transit the cheaper the tasking.

Third, states within the sub-regions tend to share similar threat perceptions and hence orbit around each other to form a security complex. For instance, the East Africa littoral might have a focus on counter-piracy measures, whilst the Southeast Asian and Australian littoral might view humanitarian assistance and disaster relief, people smuggling, and trade as their areas of interest. Identification (or more rightly the lack thereof) of a common threat perception amongst states is perhaps the single most important inhibitor for military cooperation. In the absence of a reason to commit forces and resources, the logic underpinning cooperation becomes somewhat anaemic.

Fourth, it is an inescapable fact that interoperability becomes more challenging as the number of navies in the collective grows. This difficulty manifests not just at the tactical level, but it persists at the political level as well. This has been a long standing feature of the region where many nations have preferred bilateralism over multilateralism, in particular when it relates to security.

Finally, there already exists a level of cooperation between navies within these sub-groupings and thus states could leverage off current cooperative frameworks.

But this should not be interpreted to mean that each sub-grouping would be exclusive, indeed to the contrary. By way of example, the Indian Navy may wish to participate in the Southeast Asian littoral, or the Royal Australian Navy may see benefit in pursuing relationships with the African navies, and there may even be trilateral interaction (India, Australia and Indonesia). This should be encouraged as the end-state is to promote naval cooperation, full stop. Those that have the capacity and the desire to work with other navies and sub-regions should of course do so. Alarmists might assert that the idea of partitioning the collective into four distinct areas is a proxy for establishing spheres of influence. This assertion would be wrong. Bringing like-minded folk together to pursue a cooperative agenda designed to further localised security and stability is, well, commonsense.

Just as IONS has a chairperson who provides oversight of the collective for a two-year period, this concept could be extended to the sub-regions, where coordinators might be appointed biennially to manage initiatives designed to further naval cooperation. Ultimately, what IONS should be looking for, is the development of a naval community, first within each sub-grouping and then finally as a whole: a naval community that has a shared identity and where a high degree of functional cooperation and integration exists. Without overcooking the concept, it is important to understand that the roadmap to establish a naval community will be different for each navy and each sub-grouping. Broadly, the development of these sub-groupings will take time and each will move through a number of phases, though in the main they can be categorised as: nascent, ascendant and mature. It would

be right to argue that the starting point for each sub-grouping will be different, in that some of these navies already have a high level of cooperation and integration with their neighbours.

For sub-groupings that are perhaps at the nascent stage, the manner of interaction may best be shaped around confidence building measures, personnel exchange programs, information exchange, and regular dialogue. For others, where the level of communication is more tightly coupled, then cooperation could assume a more advanced hue such as training teams, ship visits, hydrographic assistance, the development of standard operating procedures, sharing of intelligence and senior officer visits. In a mature condition, each sub-region should seek to come together regularly in an operational sense, whether it be through the contribution of naval ships, aircraft or observers, in order to validate, train and exercise in the areas that it has agreed to, or to undertake coordinated patrols or to participate in maritime surveillance. Again, the coordinator of each sub-grouping would take the lead on these initiatives. Mindful that the capacity of varying navies/police forces/coastguards/customs will differ, navies that have the resources to assist fellow navies will be expected to do so. In this manner, Marx's idiom, 'from each according to his ability, to each according to his needs,' is germane.

An IONS Passage Plan

In the early stages of this passage plan, each sub-grouping should pursue an agenda centred on the following aim points:

- maritime domain awareness
- capacity building
- interoperability
- doctrine, strategy, and procedures to address maritime areas of common interest which will be different for each sub-grouping; for example in the South Asian sub-group it might be climate, West Asian energy supply, east African counter-piracy, and Southeast Asian/Australian humanitarian assistance and disaster relief. To put it simply, what is needed is a set of standing orders.

Historically, naval cooperation has focused on navy-navy engagement, and of course this makes sense. That said the breadth and diversity of states that comprise IONS deems a one-size-fits-all-approach somewhat inflexible. More to the point, many states in the Indian Ocean have no navy *per se*, and instead rely on coastguards and police forces to enforce sovereignty, execute government policy, and support the country's maritime interests. Mindful of this, naval cooperation should take on a deeper and more inclusive meaning and embrace all elements that contribute to maritime security.

Navies generally have a reputation for excellence second to none, but in a sense, we have become victims of our own success. A case in point is the ability for shipping to cross the oceans unhindered as they ply their trade - trade that is vital to the economic health of almost all nations in IONS. Yet, the conversation on how best to protect this trade is heavily centred on naval units sanitising chokepoints or sea lines of communication. An enterprise, which IONS could explore, might be to meld the interests of the shipping community with those of naval forces in the region. Such cooperation already exists around the Horn of Africa, where the maritime security centre works in lock step with shipping owners and operators to protect trade as it passes through high-risk areas, and where the confluence of best management practices and naval cooperation has seen a marked drop in piracy. With a view that we do not wish IONS to become too unwieldy, it might still pay dividends for one of the IONS working groups to invite representatives from the commercial shipping fraternity to contribute to the debate.

The success of IONS will rest, to a large degree, on the sense of ownership by its member states. As with any form of collaboration, local sensitivities and national honour percolate to the fore. Perhaps one simple mechanism, which may induce a degree of collegiate consciousness, is an IONS Ensign. Just as all naval, coastguard and police vessels fly their ensigns at sea, navies of the Indian Ocean could similarly fly, when operating together, an IONS Ensign. Such a concept has precedence - members of the European Union fly the EU flag alongside their national flag. An IONS Ensign would not seek to supplant national ideals but rather serve to foster a spirit of brotherhood amongst IONS mariners as they pass in the night.

Sailors understand that bringing together a group of seaman and turning them into a cohesive ships company needs to be done slowly and incrementally. So too with naval cooperation. And just as shipmates learn from each other and gain confidence in each other's skills, navies working together will do likewise. Once an element of cooperative ballast exists, an opportunity may present itself for a coming together of maritime units at the same time and location as the biennial IONS. Under the ethos of IONS, each member state might consider contributing a maritime unit, observer or other. Whilst the naval chiefs are conducting their Conclave, the maritime units would be training alongside in preparation for deployment to sea. The harbour phase would consist of damage control exercises, team building, formal receptions, exercise planning and so forth. Naval units could sail together to conduct basic mariner training and if possible, more focused evolutions such as search and rescue and surveillance.

Using these principles as a guide, and in order to provide a concept of operations on how to move from soft power to hard power cooperation, a broad plan is presented in Table 1.

Timing	Activity
Year 0	Agreement to plan
	Select sub-regional coordinators
	Establish sub-regional websites, managed by coordinators
	Commence dialogue under an IONS framework
	Information exchange
Year 1	Personnel exchange programs
	Senior officer visits
	Training teams
	Bilateral ship visits
	Development of standard operating procedures
Year 2	IONS Conclave
	New sub-regional coordinators selected
	Continued progression of Year 1 activities
	Planning for sub-regional naval gathering (sub-regional coordinators)
	Planning for regional naval gathering (IONS Chair)
Year 3	Sub-regional naval gathering
Year 4	IONS Conclave
	IONS naval gathering
	New sub-regional coordinators selected

Table 1: Campaign plan for naval cooperation

Conclusion

Is the Indian Ocean exceptional? Perhaps not 20 years ago. But as the world's economic epicentre shifts from Europe to Asia, there has been a commensurate swing in importance from the Atlantic to the Indian Ocean. The sea blindness of the past may account for the rather unusual circumstance that it took till 2008 for a maritime security organisation to be stood up in the Indian Ocean region. What is not questioned is the legitimacy of IONS. But the need is surely there. Inevitably, where poverty and a breakdown in governance exist, wrongdoing is not far away, and this idiom has proven itself in the far reaches of the Indian

Ocean where piracy, narco-terrorism and transnational crime have proliferated. That said, maritime cooperation has a plethora of other dimensions and these include non-traditional security threats such as climate, humanitarian assistance and disaster relief, people smuggling, and search and rescue.

Operationalising naval cooperation within the IONS sphere is no easy task. As Clausewitz eloquently affirmed, war (ergo: the military) is the continuation of policy by other means. Navies have always been a powerful instrument of statecraft, and will continue to be so, and this point adds complexity to the IONS equation. In looking around for precedence in this area, WPNS quickly springs to mind. Whilst I have cautioned about replicating that model, it is reason for pause to note that WPNS has been in existence for 26 years and has 21 participating navies. On the flip side, IONS history is less than 7 years old with 35 member navies. And hence the argument therein that breaking down these numbers into more manageable sizes and coagulating navies into sub-groupings that have shared interests, may have a more successful outcome. By having four loci in the IONS collective, navies can, to begin with, concentrate on areas of cooperation that are important to that region. Over time, as the maturity of each sub-grouping grows, the collective can come together to hone their skills and practice their art.

IONS and naval cooperation are two sides of the same coin. Indeed the legitimacy of IONS will hinge on what can be achieved between navies, coastguards and police forces. This cooperation will not however take place overnight and needs to be mapped out in a logical, non-offensive and sustainable manner. Purists would consider that naval cooperation is about military platforms working and exercising together; yes this is an important tenet, but it is not the core reason why states contribute military forces to work as one. Naval cooperation is, in essence, about promoting collective self-interest over the individual interests of member countries.

There is a Hindustan proverb that runs along the following lines: *Kabhi nao gari par, kabhi gari nao par* [sometimes the boat is on the wagon and sometimes the wagon on the boat]. But the meaning is more poignant: individuals of different rank and qualities have it in their power to help each other. And to some degree, I believe that the IONS navies can draw upon this proverb.

Lessons from the ADMM-Plus Experts' Working Group on Maritime Security

Suriani Ahmad

The focus of my paper is on the activities of the Experts' Working Group on Maritime Security conducted under the auspices of the ASEAN Defence Minister's Meeting-Plus (ADMM-Plus), to inform the deliberations of the Indian Ocean Naval Symposium with regard to maritime security.

Establishing the Experts' Working Group on Maritime Security

The ADMM-Plus grouping identified five focus areas for action, namely: humanitarian assistance and disaster relief, maritime security, military medicine, counter-terrorism and peacekeeping operations (subsequently a new area, and thus new working group, was established to examine humanitarian mine action).

To examine these areas for action, experts' working groups were created, reporting to the ASEAN Defence Senior Officials' Meeting-Plus (ADSOM-Plus) Working Group initially and then to ADSOM-Plus and finally to ADMM-Plus; in essence progressively reporting to the Secretary General/Permanent Secretary level and then to the Defence Ministers' level.

From July 2011 to January 2014 I had the privilege of co-chairing the Experts' Working Group on Maritime Security together with my two Australian counterparts, initially Commodore Vince Di Pietro, RAN and then Commodore Stuart Mayer, RAN.

While we were at first cautious as to how we would plan to move ahead, we tabled a concept paper that was agreed at ADSOM-Plus held in Indonesia in April 2011. The concept paper recognised two things:

> First, that it is important to secure sea lines of communication, for the economy and security of the Asia-Pacific region; and second, there are myriad of challenges in the maritime domain including piracy and armed robbery, illicit trafficking in drugs and arms, people smuggling and illegal fishing.

The establishment of an Experts' Working Group (EWG) was deemed useful to develop effective cooperation in countering these challenges. To achieve this, we began by identifying areas of common interest across the spectrum of maritime security challenges, which could then be further explored to develop practical

initiatives for defence and military cooperation. In order to maintain good order at sea, we focused on enhancing maritime cooperation at a multilateral level, analysing significant regional maritime security threats and considered how to provide for wider information sharing.

As there are already a number of groupings/arrangements addressing maritime security concerns in the region, such as: the ASEAN Regional Forum Inter-sessional Meetings on Maritime Security, the ASEAN Maritime Forum, Regional Cooperation Agreement on Combating Piracy and Armed Robbery Against Ships in Asia, the Western Pacific Naval Symposium and the Indian Ocean Naval Symposium; we felt it was important that we complemented their activities to avoid any duplication of effort.

In its early stages, the EWG focused on developing a common understanding of maritime security, sharing perspectives and developing cooperative mechanisms that would be acceptable to all ADMM-Plus members. In order to achieve this, the EWG planned to meet twice a year. During 2011 the EWG planned to identify common areas of interest, priority challenges and concepts for future cooperative activities; to be followed by mechanisms for the exchange of perspectives on the security impacts of the issues and to improve information sharing. During 2012, a scenario-based workshop was planned to explore potential cooperation, assess progress thus far and refine the work plan. By 2013 it was expected that information sharing would become more systematic and credible and that practical cooperation would be illustrated through an exercise.

Meetings

The maritime security EWG was the most active of the five groups, having met on seven occasions since its inception in April 2011 and its conclusion (under its current co-chairs) in January 2014.

We decided to meet twice a year so that we could effectively monitor implementation of the planned activities. This was important as we all recognised the dynamic nature of maritime security issues and the challenges we would face. We therefore had to have an appreciation of existing maritime security challenges and to incorporate them into our planned initiatives to counter them; otherwise the work of the EWG would be irrelevant.

Both the Malaysian and Australian co-chairs appreciated and were very encouraged by the pragmatic, open and community-minded approach the delegates took in discussing maritime security challenges. Members focused on what could be realistically achieved collaboratively rather than on areas where our many interests differ. This goodwill and cooperative effort saw the EWG achieve its mandated practical defence outcomes.

ADMM-Plus Maritime Security Community Information-Sharing Portal

We agreed in 2012 that a website to promote information sharing should be established, on the basis that one key theme pervading multilateral regional dialogues including the ADMM-Plus, was the need for greater information sharing.

EWG members then agreed to consider the development of a webpage as a broader information sharing tool to be referred to as AMSCIP, which was launched in 2013 and is now operational.[1]

The Portal serves as a focal point for EWG administration, as well as a repository of relevant information about other bodies active in maritime security. Its utility is essential as EWG members are busy, scattered across the globe, but in some way or another connected to the global IT highway. The Portal has great potential for us now and our colleagues in the future and it can be used to establish a focal point where members post academic papers, exchange ideas and discuss policy issues.

Field Training Exercise

From 29 September to 1 October 2013, Malaysia and Australia hosted the inaugural ADMM-Plus Maritime Security field training exercise at HMAS *Creswell*, on the shores of Jervis Bay.

The process leading to this exercise included planning conferences and a table top exercise. This process enabled the participants to prepare and structure the implementation of the field training exercise by providing the possible scenarios and discussing potential responses and courses of action. The table top exercise worked on the guiding principles to de-escalating situations, increasing the likelihood of safe outcomes for mariners and encouraging proactive assistance, support and partnership across ADMM-Plus. It was the first practical activity in the EWG and regarded by Malaysia's Defence Minister at that time, Dato' Seri Ahmad Zahid Hamidi, as 'a significant milestone in promoting the spirit of cooperation, in the wider context of the Asia-Pacific region'.

The table top exercise generated enthusiasm among EWG members for a field training exercise at sea to establish an ADMM-Plus interoperability baseline; and highlighted the importance of information sharing among the ADMM-Plus countries as well as the significance of timely and effective coordination in pursuing cooperative activities to ensure regional maritime security.

The aim of the field training exercise was to promote practical maritime cooperation in information sharing among ADMM-Plus countries and to build a common understanding that would establish baseline interoperability procedures in maritime security matters. The field training exercise had four key objectives:

1. to enhance mutual understanding and interoperability in maritime security operations, focusing on boarding exercises
2. to develop and trial an ADMM-Plus Maritime Security communications and command and control architecture
3. to derive maximum individual and unit training benefit
4. to contribute to regional engagement and maritime security capability amongst ADMM-Plus countries.

Thirteen countries participated in the field training exercise including Malaysia which sent the frigate KD *Jebat*. The field training exercise gave focus to information sharing, the building of a common understanding and the establishing an interoperability baseline between ADMM-Plus countries.

The field training exercise involved five main phases ranging from preparatory briefings and boarding demonstrations to post-exercise workshops to identify achievements and improvements to the field training exercise.

At the January 2014 EWG meeting, several lessons learned were identified which might inform the activities of the Indian Ocean Naval Symposium:

1. During boarding exercises, it is useful to have umpires from both the boarding party and the ship receiving the boarding party. Countries that do not assign a ship to participate in the field training exercise should provide a boarding party with necessary equipment.
2. A communications plan is important and beneficial. It is also useful to translate key words and tactical/operational verbs into various languages.
3. Information sharing - the continued high level collaboration between the lead planners of the different navies and defence departments proves useful.
4. Lack of familiarity with multilateral standard operating procedures, publications and language issues can be mitigated by a series of planning conferences, exercise instructions and other preparations.
5. Participating countries' capabilities need to be effectively incorporated into the planning process.
6. Sufficient time for pre- and post-exercise meetings and equal participation are needed.
7. Early establishment of a logistics cell is helpful.
8. It is useful to have lessons learned workshop to gather comprehensive findings.

The co-chairs were encouraged by the strong demonstration of support for the exercise from ADMM-Plus member countries. It was a significant demonstration of practical cooperation and a substantial achievement for the EWG. The conduct of the field training exercise signified the culmination of practical cooperation among EWG members during its first term.

Conclusion

From the inaugural meeting in July 2011 in Perth to its seventh meeting in January 2014, the EWG has grown positively - from identifying common interests, to developing constructive work plans and then to the 2013 field training exercise in Jervis Bay, off the east Australian coast.

In a span of approximately three years EWG members grouped together and worked towards addressing current maritime security issues and how they could be best resolved in concert - this is quite an achievement.

The EWG successfully operated within the ADMM-Plus guiding principles of openness and being outward-looking. As the EWG transitions to its new co-chairs (Brunei and New Zealand), Malaysia and Australia hope the firm foundations they laid down will enable continued and positive outcomes.

Notes

1 It can be visited at www.amscip.org.

Collaborative Capacity Building in the Indian Ocean

Hasjim Djalal

Indonesia has long been active in building and developing cooperative efforts, including capacity building, in and around the Indian Ocean. In 1955 it organised the Asian-African Conference in Bandung, bringing together the Asian African countries, particularly around the Indian Ocean, to end colonialism and neo-colonialism in an area where people and countries had been subjugated for centuries. At one time, President Sukarno even called the eastern part of the Indian Ocean the 'Indonesian Ocean', hoping to make Indonesians realise the significance of the Indian Ocean to them.

With the emergence of the Cold War, the Indian Ocean became an area of competition between the Eastern and the Western blocs, and some external powers built military bases in the region, such as at Diego Garcia. The Cold War also 'divided' the Indian Ocean countries in their economic development policies between a western liberal system and the eastern model of a strongly centralised system. Efforts to develop cooperative relations among the Indian Ocean countries along this political/ideological cleavage was attempted by Madagascar in the 1960s when it organised an Indian Ocean conference, but nothing eventuated from it.

Later, countries began to appreciate the economic potential of the Indian Ocean, particularly fishery resources, which thus far had been mainly exploited by far distant countries such as Japan, Republic of Korea, Taiwan and others. This became an important factor in propagating the concept of the exclusive economic zone during the United Nation Conference on the Law of the Sea III (1973-82).

Later again, some countries began to appreciate the mineral resource potential on the Indian Ocean seabed. India began exploring polymetallic nodules in the central part of the Indian Ocean; China became interested in the seamount metal crust in the southwest Indian Ocean mountain ridge; and Republic of Korea became interested in the mineral resources of the international seabed area in the Indian Ocean. These countries have obtained exploratory rights for those minerals in specified areas of the international seabed area in the Indian Ocean beyond the continental shelf/margin of the coastal states. They, as well as Japan have or are developing methods for exploration and exploitation of the deep seabed mineral resources. These methods should be one of the topics for the collaborative capacity building in and among Indian Ocean countries,

in addition to the cooperative capacity building with regard to other aspects of the ocean management, such as fisheries, environmental protection, marine scientific research, as well as law enforcement capabilities.

In view of this, Indian Ocean countries, including Indonesia, have for a number of years have been attempting to develop 'collaborative capacity building' in order to be able to manage the Indian Ocean space as well as its resources in a more constructive and collaborative manner, and in some cases by including other interested non-littoral countries as well:

- In the 1980s, Indonesia established the Centre for Indian Ocean Studies at the Andalas University in Padang, West Sumatra, on the edge of the eastern shore of the Indian Ocean. The Centre, however, needs more collaborative programs with other similar centres/institutes around Indian Ocean.
- Indonesia, together with Sri Lanka, Kenya, Tanzania, Pakistan and others established the Indian Ocean Marine Affairs Cooperation (IOMAC), headquartered in Colombo. It primarily works on scientific and resources management, primarily of fisheries, as well as on other cooperative efforts. It needs rejuvenation as India is not a member, albeit occasionally attending meetings as an observer.
- Australia has been very active in developing cooperative programs on the Indian Ocean, although not always as formal or Track 1 activities. Some years ago, Curtin University organised the Informal Forum for the Indian Ocean Region in Perth, seeking to promote cooperation in the Indian Ocean region, particularly on resources management, safety of navigation, environmental protection, as well as on scientific and educational cooperation.
- Indonesia, together with India, Kenya, Tanzania and others have cooperated in building a more formal Indian Ocean architecture for cooperation. After the Arusha Declaration at the Indian Ocean conference in Mauritius, the Indian Ocean Rim Association for Regional Cooperation (IOR-ARC) was established and renamed the Indian Ocean Rim Association (IORA) in late 2013. A number of meetings in various capitals of the Indian Ocean countries, attempting to promote cooperative programs, which also include collaborative capacity building.

- Lately, we have also seen the development of the Indian Ocean Naval Symposium (IONS), just like the Western Pacific Naval Symposium (WPNS). I understand that the IONS would like to contribute more toward the security of the Indian Ocean, particularly in view of the development of the geo-strategic relations among the Indian Ocean states and its surrounding areas. Developments in the South China and East China seas are now more inter-linked with developments in the Indian Ocean. In fact, India and Australia are now more interested in developments in the South China Sea and Southeast Asia and East Asia in general. India has broadened its foreign policy from 'look East' to 'engage East' and now 'act East', signifying its interest in Southeast Asia and in the South China Sea, and therefore also in the Malacca and Singapore straits. At the same time, Australia and the United States are also showing more interest and attention to East Asia, including the South China and East China seas, and building up military (naval) capacities in Darwin, Christmas Island, as well as on Cocos Island. I presume that these policies are preparing for possible unwanted developments in the South China Sea, particularly the possibility of more Chinese interest and military activities there and in the Indian Ocean.

- It is also interesting to note that Australia is now buying US Navy Triton unmanned aerial vehicles (UAV), that can cruise for up to 30 hours sweeping a distance greater than Sydney to London with 360° radar and censors, including infra-red and optical cameras at the same time. Apparently they will be used in northern Australia to monitor Australia's maritime borders. It seems to me that the possibility of employing long distance UAV would put Indonesia in the middle between their deployment and their possible targets that may include the South China Sea and even perhaps Indonesia. In such a case, Indonesia would be 'sandwiched' between Australia and the South China Sea. Perhaps some collaborative capacity building among the relevant countries in the Indian Ocean could be worked out on how to deal with the possible challenges of the employment of the long-range UAV, so that their unexpected consequences could be avoided. It is important to see that this development does not upset the peace, stability, and cooperative efforts in the Indian Ocean.

There are numerous factors that could impact on and upset the peace, stability, and development in the Indian Ocean that require collaborative capacity building to prevent them.

Most Indian Ocean countries, including Indonesia, require the resources of the Indian Ocean, either living or non-living, for their development. In this context, it should be noted that:

- All of the Indian Ocean states are members of the United Nations, and therefore they should abide by the UN Charter in managing their relationships with each other.
- All of the Indian Ocean states are parties to the *United Nations Convention on the Law of the Sea 1982* (LOSC) and its Implementing Agreements, either for seabed mining (1994) or for straddling and highly migratory fish stocks (1995). They should also follow the provisions of the convention and agreements in building cooperative relations among themselves, including on how to take advantage of those resources and how they could take advantage of the activities of the International Sea Bed Authority.
- I believe all Indian Ocean states are members of the Food and Agriculture Organization (FAO), and therefore are aware of its efforts in managing the tuna resources through the Indian Ocean Tuna Commission (IOTC), headquartered in Seychelles. They should make use of the IOTC to manage the highly migratory tuna resources of the Indian Ocean in order to be able to take advantage of the resources for their economic development.
- Some of the Indian Ocean states may also be interested in the exploitation of the southern blue-fin tuna, which is one of the most important resources of the Indian Ocean involving many regional and non-regional countries. The Convention on the Conservation of the Southern Blue-fin Tuna (CCSBT) is headquartered in Canberra, so Australia could take the lead in increasing the knowledge of the Indian Ocean states regarding the nature as well as the economic value of these resources, and in what way and how they could take advantage of them.

The Indian Ocean is a very large ocean, the 2nd largest after the Pacific Ocean, and has peripheral seas, such as the Arabian Sea, the Gulf of Bengal, the Andaman Sea, the southwest Indian Ocean, and others. There are also plenty of 'approaches' to the Indian Ocean, either through the 'straits used for international navigation' or through the 'archipelagic waters' of Indonesia. For these reasons, Indonesia, Malaysia and Singapore have been cooperating for the last 40 years to develop

a cooperative regime for the Malacca and Singapore straits that would assure safety of navigation and the protection of the marine environment. Recently, on the basis of LOSC Article 43, and in cooperation with straits users and the International Maritime Organization (IMO), they established the Cooperative Mechanism for the Straits of Malacca and Singapore. In the meantime, Indonesia has also established 'archipelagic sea lanes passages' on the basis of LOSC Article 53 for navigation between the Pacific Ocean and the South China Sea to the Indian Ocean and vice versa. Both the establishment of the Cooperative Mechanism and 'archipelagic sea lanes' have been conducted with the cooperation of the IMO in accordance with LOSC provisions. It would also be helpful if the countries around those seas peripheral/around the Indian Ocean could also develop some collaborative capacity building for the development of the resources of the seas as well as for the promotion of safety of navigation and marine environmental protection and, as necessary, for scientific research purposes and development of technology.

In addition, there may be some problems concerning the delimitation of various maritime boundaries between the neighbouring Indian Ocean states as well as the limit of their jurisdiction to the open Indian Ocean seas and seabed area. I notice, however, that unlike in the South China Sea, there seems to be not many significant conflicting territorial claims in the Indian Ocean, although there may be some problems in maritime boundaries and jurisdiction between the states in the Indian Ocean, such as on territorial sea, exclusive economic zones, and continental shelf and continental margin. These problems, if they exist, should also be settled as soon as possible before they get out of control. These problems should be settled by the countries concerned through negotiation, although the 'good offices' of other states could be sought if agreed by the parties concerned.

Other problems, such as 'piracy' and 'international terrorism' occur in the Indian Ocean, particularly off Somalia and in the Gulf of Aden as well as in the Malacca Strait and in some parts of Indonesian waters. Fortunately, through cooperation among states, those problems have become less frequent and hopefully will completely disappear in the future. In this context, some collaborative capacity building would be useful and IONS could play a role in promoting efforts to banish piracy all together.

Other problems that require capacity building in the Indian Ocean states would be on how to deal with climate change and sea-level rise. Some countries in the Pacific Ocean and in the South China Sea are becoming more aware of this problem. This issue could also become a major problem for countries in the Indian Ocean region, like Maldives and some collaborative capacity building could also be required for this purpose. I understand that Maldives has been looking into this problem, and thus it could take some leading roles in developing collaborative capacity building to deal with it.

Another problem faced by Indian Ocean countries in recent years is how to deal with the impact of a tsunami. Indonesia was devastated by an Indian Ocean tsunami in late 2004 that took some 200,000 lives. Other countries in the Indian Ocean have also experienced some consequences of tsunami, such as Sri Lanka, Thailand, India, and some east African countries. The experience of the 2004 tsunami shows that Indian Ocean states and other states have a strong willingness to cooperate and overcome the consequences of the tragedy. It would be important if some countries, particularly the more experienced on this issue, take the initiative on how to increase collaborative capacity building to deal with the potential threats of tsunami.

Finally, there is also the problem of the trafficking of illegal migrants, people, and narcotic drugs in and among Indian Ocean countries. Some countries around Indian Ocean are the countries of origin, some have become transit countries and others have become destination countries. I understand the United Nations High Commissioner for Refugees has been expressing some concerns on this matter, just as some ASEAN countries do. It would be useful if a country, particularly the destination country, could organise some collaborative capacity building to deal with this matter, particularly some kind of arrangement between the countries of origin, the transit countries, and the destination countries.

In conclusion, the more advanced Indian Ocean countries should be able to take more active role in developing capacity building in a collaborative manner.

Australia could take the lead on increasing scientific knowledge of Indian Ocean resources, either living or non-living; and in particular with regard to defining claims to the continental margin of the Indian Ocean states beyond 200nm from their respective baselines. Within the context of IONS, Australia should also take the leading role in promoting collaborative capacity building for dealing with UAV, particularly differentiating between friendly and unfriendly, and how to deal with them.

India should take the leading role on increasing knowledge and capacity in a collaborative manner with regard to development of methods for the exploration and exploitation of the seabed minerals resources.

At the same time Australia and the FAO should take the leading role in increasing knowledge and awareness of the Indian Ocean states to the potentials of tuna resources in the Indian Ocean, either through the IOTC or the CCSBT.

There are numerous exclusive economic zones in the Indian Ocean in and over which the freedom of navigation and over-flight are guaranteed by LOSC. Yet some experiences like in the South China Sea show the need to manage the conduct of military exercises and intelligence gathering activities in the exclusive economic zones of other countries do not endanger their security and safety. In the past,

some Indian Ocean countries, such as Australia, India, Indonesia, Malaysia, and others have participated in discussions to develop certain guidelines on this matter; it may be useful if the Indian Ocean countries began to look into this issue before it becomes a problem or source of conflict as it has in the South China Sea.

Finally some experiences on the efforts to manage potential conflicts in the South China Sea that have lasted for more than 23 years could be used as a model. The South China Sea workshop is Track 1.5 diplomacy, where its participants are appointed by their governments but participate in their personal capacities. First, they are working to devise collaborative programs in which everyone or authority can participate, including China and Taiwan, hopefully that they will learn how to cooperate with other South China Sea countries rather than how to confront each other. Second, they also encourage the parties involved in the conflict to seek solutions as soon as possible to their problems, and third, they seek to develop some confidence building measures or process among the parties concerned so that they will not complicate the matters, including practicing self restraint as much as possible. These methodologies may also be employed with regard to the Indian Ocean, particularly with regard to seeking some collaborative project that could include participation by all interested authorities or states.

Comments