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Asymmetric threats and their challenges to freedom of navigation

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ASYMMETRIC THREATS AND THEIR CHALLENGES TO FREEDOM OF NAVIGATION

by

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DECLARATION

I certify that all the material in this dissertation that is not my own work has been identified, and that no material is included for which a degree has previously been conferred on me.

The contents of this dissertation reflect my own personal views, and are not necessarily endorsed by the University.

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ABSTRACT

Title of Dissertation: **Asymmetric threats and their challenges to freedom of navigation**

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Asymmetric threats in the maritime domain are a lurking danger that can rear its head when least expected, to unleash death and destruction to life and property. While the September 11 attacks against the twin towers and other US targets were not maritime terrorist incidents, these incidents nonetheless completely transformed the shipping and port industries' outlook towards security. Ports and harbours which were once tourist places of interest were literally converted to fortresses with armed guards, barbed wire fences and CCTV network. Access to ships and ports became restricted and heavily regulated, drills and security exercises became the norm thanks to the ISPS Code. Soon many security initiatives were launched, including some notable US led programmes such as CSI, PSI and CT-PAT to try to mitigate the risks in the maritime domain. Some of these initiatives especially SUA 2005 and PSI have the tendency to challenge the traditional right of freedom of navigation. This research analyses the asymmetric threats in the maritime domain and how they would affect the present day concept of freedom of navigation with the possibility of its derogation by states, through security initiatives and phenomenon of creeping jurisdiction, when faced with maritime terror and other violent attacks.

KEYWORDS: Asymmetric Threats, Asymmetric Warfare, Freedom of Navigation, Maritime Domain Awareness, SUA, PSI, WMD, UNCLOS.

LIST OF ABBREVIATIONS

A.D.	Anno Domini
AIS	automatic identification system
AJIL	American Journal of International Law
AMVER	Automated Mutual Assistance Vessel Rescue System
AQ	Al Qaeda
ASG	Abu Sayyaf Group
AUSREP	Australia Ship Reporting System
B.C.	Before Christ
BCN	biological, chemical and nuclear
BP	British Petroleum
CBD	constrained by draught vessel
CBRN	chemical biological radioactive and nuclear
CCTV	closed circuit television
COA	course of action
COTS	commercial off –the- shelf
CSI	Container Security Initiative
CSO	company security officer
CSR	continuous synopsis record
CTPAT	Customs and Trade Partnership against Terrorism
CZ	contiguous zone
DIILS	Defence Institute of International Legal Studies
DIIS	Danish Institute of International Studies
DPRK	Democratic People's Republic of Korea
EEZ	exclusive economic zone
ELINT	electronic intelligence
ETA	expected time of arrival
EU	European Union

GMI	global maritime intelligence
GMSA	global maritime situational awareness
GPS	Global Positioning System
GT	gross tonnage
HNS	hazardous noxious substances
HUMINT	human intelligence
ICJ	International Court of Justice
IED	improvised explosive device
IMB	International Maritime Bureau
IMCO	Intergovernmental Maritime Consultative Organisation
IMO	International Maritime Organisation
INDSAR	Indian (Maritime) Search and Rescue
ISO	International Organisation of Standardisation
ISPS	International Ship and Port Facility Security Code
ISSC	International Ship Security Certificate
ITLOS	International Tribunal for Law of the Sea
JI	Jemaah Islamiyah
L e T	Lashkar -e –Toiba
LNG	liquefied natural gas
LPG	liquefied petroleum gas
LRIT	long range identification and tracking
LTTE	Liberation Tigers of Tamil Eelam
MDA	maritime domain awareness
MDIZ	maritime detection and identification zone
MIPT	Memorial Institute for Prevention of Terrorism
MIU	Marine Intelligence Unit
NUC	not under command
OECD	Organisation for Economic Cooperation and Development
PFSO	port facility security officer
POB	personnel on board

PRC	Piracy Reporting Centre
PSI	Proliferation Security Initiative
RFID	radio frequency identification
SAFE	Secure and Facilitate Global Trade
SAR	search and rescue
SIP	Statement of Interdiction Principles
SOLAS	International Convention for the Safety of Life at Sea, 1974 as amended
SSAS	ship security alert system
SSO	ship security officer
SSP	ship security plan
SUA	Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation, 1988
SUA 2005	the 2005 Amendments to SUA
TEU	twenty foot equivalent unit
U.S.	United States of America
ULCC	ultra large crude carrier
UN	United Nations
UNCLOS	United Nations Conference on the Law of the Sea
UNCTAD	United Nations Conference on Trade and Development
UNODC	United Nations office on Drugs and Crime
UNTOC	United Nations Convention against Transnational Organised Crime, 2000
UNSCR	United Nations Security Council Resolution
USS	United States Ship
UTC	coordinated universal time
VBIED	vehicle (vessel) borne improvised explosive device
VLCC	very large crude carrier
WGS	world geodetic system
WMD	weapon of mass destruction

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Chapter 1

Introduction

1.1 Background

Shipping, since the time mankind first sailed the oceans, has evolved from the deep rooted tradition of freedom of the seas, of which freedom of navigation is one aspect. The concept of freedom of navigation has undergone frequent transformations as per the dictates of time and the practice of states. After the codification of customary laws of the sea under the United Nations Conference on the Law of the Sea (1982), the concept of freedom of navigation was preserved albeit via innocent passage through territorial sea, transit passage through international straits and flag state jurisdiction on the high seas. Thus the concept of freedom of navigation of the Grotian era was replaced by a structured and more regulated regime through UNCLOS. This shift towards a more regulated maritime domain came about mostly due to growing technological advancement in management of ocean resources coupled with growing concerns for safety of human life and the marine environment. Environmental issues dominated the maritime domain until 9/11.

The September 11 attacks acted as a catalyst to signify the dangers posed by asymmetric threats to shipping. The attacks on USS *Cole* and MT *Limburg* exposed the vulnerability of maritime targets to asymmetric attacks. The importance of the shipping industry is paramount for sustenance of the global economy. The rapid pace of globalisation in the recent past has seen growth in trade and commerce rise drastically, 90% of which is attributed to shipping. The merchant shipping industry

world over has more than 50,000 ships and this number increases by approximately 3000-3300 ships annually at an approximate rate of 6.7% (UNCTAD 2009). These rising volumes of trade and shipping, crisscrossing the oceans, have posed a tremendous challenge to law enforcement agencies all over the world. According to Rand Corporation analyst Peter Chalk (2009, p.127) "the maritime environment will likely remain a favourable theatre for armed violence, crime and terrorism given its expanse, lack of regulation and general importance as a critical conduit for international trade". Asymmetric threats in the maritime domain arise mostly from non state actors who can use ships as floating bombs to destroy ports and other maritime infrastructure. The navigational freedoms arising out of flag state jurisdiction are now being considered an obstacle in the war against terror and other security issues. As a result of which interferences on the high seas have, within recent years, become quite common. Interferences though can lead to greater security for navigation; however, at the same time, besides causing undue delay and economic loss to the ship owner, these are viewed as derogations to traditional freedom of navigation (Wendel, 2007). The challenge, therefore, for law enforcement agencies is to find the right balance. Interdiction and boarding at sea does affect navigational freedoms but these are also measures to deter perpetrators from wrong doing. Lack of policing and interdictions at sea might lead to lawlessness and insecurity especially when dealing with WMD proliferation which is detrimental to international peace and security. This dissertation aims to analyse the aspects of asymmetric threats, consequences of terror attacks, maritime security initiatives and their impacts on freedom of navigation.

1.2 Objectives

This research intends to analyse the asymmetric threats in the maritime domain and their impact on the freedom of navigation. The research thus intends to first discuss the concept of freedom of navigation and trace its transformation through the centuries. Secondly, the research also intends to introduce the concept of asymmetry and discuss various asymmetric threats in the maritime domain, consequences of

possible terror attacks, modus operandi of maritime capable terror organisations and associated risks. Although piracy and organised crime, which are committed for financial gains, also constitute the asymmetric threat dimension, the main focus of this research will be on asymmetric threats from terrorism and insurgency both of which are politically motivated. Finally the author intends to focus on the pros and cons of various maritime security initiatives and domain awareness tools, and the likely impact of terror attacks on the freedom of navigation due to various security initiatives and state practice related to security.

1.3 Research Questions

The following research questions need answers in order to reach a conclusion:

1. What is the concept of freedom of navigation?
2. How has the concept evolved through the years?
3. What is asymmetry and what constitutes asymmetric threat in the maritime domain?
4. What are the capabilities and modus operandii of various maritime terror organisations?
5. How vulnerable is the maritime domain to asymmetric attack?
6. What are the important maritime security initiatives and how do they counter asymmetric threats?
7. What is maritime domain awareness and how does it counter asymmetric threats?
8. What are the likely regulatory ramifications in the event of a terror attack and how will they impact on the freedom of navigation?

1.4 Scope

The scope of this research will include discussions pertaining to the evolution of freedom of navigation through the years, asymmetric warfare, and asymmetric threats in the maritime domain, the various maritime security initiatives and how

they measure up against asymmetric threats. The scope of the research will also extend to analyses of vulnerability and attractiveness of maritime targets against asymmetric attacks, the concept of maritime domain awareness, its tools and its effectiveness and the impact of terror attacks on freedom of navigation due to regulatory Conventions, state practice and security initiatives.

1.5 Research method

The principle research method applied in this study is qualitative analysis. This was undertaken mainly by collating the information available from a literature search. The details on the history of freedom of navigation are researched from well publicised history books, journals and encyclopaedia. The literature on asymmetric concepts and warfare is mainly obtained from military journals, doctrines and unclassified reports as the concepts have evolved mainly from military doctrines. The research also gathers information on piracy and security related information from the IMB, analyses documents released by various terrorism and security databases like Rand Corporation, published government reports and military thesis. Aspects of creeping jurisdiction, erosion of freedom of navigation and compliance with laws of the sea in letter and spirit by state parties to UNCLOS are explored through journals and books. Further the aspects of maritime domain awareness and security initiatives and their influence on freedom of navigation are explored through relevant literature and internet research.

1.6 Organization

This dissertation is organised into six chapters. Chapter One, which is the present chapter offers an introduction to the research topic, establishes the objectives, research questions and mentions the scope of the research work and the methodology adopted. Chapter Two will discuss the origin of the freedom of navigation and trace its development, trends and relevance through the years. Chapter Three will introduce the concept of asymmetric warfare and discuss the various threats to

maritime security. This will be followed by Chapter Four which will focus on maritime asymmetric attacks, organizations and capabilities of various terror networks, and discuss the possibility of a nexus between terrorists and pirates. Chapter Five will analyse the various threat countermeasures and the challenges they pose to navigational freedoms and finally Chapter Six will conclude with a discussion of the challenges to navigational freedoms through state practice and security initiatives by generating hypothetical situations and offer some conclusions in that regard.

Chapter 2

Freedom of navigation – Its origin, trends and relevance

2.1 Background

Archaeological evidence shows that man sailed oceans far earlier than he started to move the distance on land (Wilford, 2010). Some authors have even remarked that there were sailors before there were farmers and shepherds to prove that seafaring has been a vital part of human history (Bass, 1972; Gold, 1981). History is also witness to the Egyptian invention of sails some 8000 years ago to power ships to ply the oceans (IMO, 1998). Subsequent sophistication in the design of sail and ship increased the speed, distance and carrying capacity thus helping to establish trade link between states. Seaborne trade has been associated with many past civilizations like that between Indus and Sumerian in the third and second millennium B.C., followed by Phoenicians, Judeans and Greeks, all successively becoming principle seafaring states in the later years.

It is strongly believed that flourishing trade evolved under the basis of international custom and the regulations governing it. There were even steps to codify these customs into laws. Hammurabi's codes did address the maritime segment; however, it is the Phoenicians who are credited with the first sea law (Lobingier as cited in Gold, 1981). The fading away of Phoenician domination tilted the balance of maritime supremacy in favour of the Greeks in the Mediterranean region who established courts to deal with maritime matters (Gold, 1981). In India, the codes of Manu enriched commercial aspects of law around the same time of the Greek

domination. The Rhodians appeared on the scene towards the latter half of the period of Greek domination with their own set of laws that, according to some writers,[1] provided the basis for Roman laws. However, there are differing opinions on the matter. Roman law as it evolved through the compilation and codification of customary practices and judgments incorporated doctrinal aspects which prevail even to this day (Mukherjee, 2002).

Roman law, contained rules that regarded seas as *naturali iure communia omnium* (common to all by natural law); however, with respect to the Mediterranean, it followed a double standard on the pretext of self determined obligation for preserving law and order (Vitzthum, 2002). The state practice in those times namely by Rome, Venice and Rhodes was to exercise rights over maritime zones in order to preserve law and order against pirates who were considered as *communis hostis omnium* (common enemy of all)(Vitzthum, 2002).

The decline of the Roman Empire in the beginning of the age of discovery saw the emergence of new independent states in Europe. This was also the period in which the race for dominance in sea power commenced with Spain and Portugal leading the pack, closely followed by the Dutch and the English. The "seas common to all" concept that developed under Roman law was pushed to the backburner in 1493 when under Papal bull and under the Treaty of Tordesillas, the sea was apportioned between Spain and Portugal thus allowing these two states exclusive rights related to navigation in their respective domains (Anand, 1973).

[1] Selden, Azuni and Lobinger support the view that the Roman codes evolved out of Rhodian law whereas writers like Bynkershoek, Benedict, Gilmore and Black strongly oppose the view.

2.2 Freedom of navigation, genesis and development

The following section will discuss the genesis of the concept of freedom of navigation and how it was used, abused or transformed depending upon the dictates of time, space and state practice during the subsequent years since its genesis.

2.2.1 Period 1600-1800

The Spanish and Portuguese domination and control of the seas and Dutch initiatives to break this monopoly brought Grotius on to the scene as an advocate for the Dutch East India Company to propound his doctrine on freedom of the seas through his thesis in *Mare Liberum* or The Free Seas published in 1609. There is universal agreement that Grotius was the first to proclaim the freedom of the seas doctrine even though the same was declared a binding principle in Roman law (Anand, 1973). However, with the fall of the Roman Empire the doctrine had also been forgotten. The origin of the doctrine is debatable and a matter of opinion because while modern international law writers believe without doubt that the concept of the freedom of seas evolved in Europe based on European beliefs and customary practice (Vitzthum, 2002), there are also those like Anand who advocate that the concept was already well recognized by customary law in Asia and codified and well publicized in the maritime codes of Maccasar and Malacca, which were compiled in the thirteen century A.D.

Further, the rules of maritime law and the freedom of navigation practiced by Asian states and explained and recommended in a European context by Grotius were not immediately acceptable to European states, which were at war with each other in their bid to vie for the Asian spice trade (Anand, 2002). The freedom of navigation became a casualty in Europe following the apportionment of the seas not only between Spain and Portugal but also due to claims by Venice over the Adriatic Sea, English domination of the North Sea and Denmark's closure of the Sound to virtually

block movement to the Baltic, all this while the tradition of navigational freedom continued in Asia (Fulton, 1911).

The struggle for dominance at sea witnessed many battles and, following the Dutch victory over the Portuguese, even Grotius, who advocated *Mare Liberum,* shed his theory of freedom of seas doctrine to support the Dutch monopoly of trade against the English. In the famous battle of books *Mare Liberum* vs *Mare Clausum* (closed seas) propounded by John Selden, which was an exception to the free seas doctrine, the victor apparently was *Mare Clausum* due to states practice of consolidation of sea domination (Mukherjee, 2002). Freedom of navigation during this period was conveniently forgotten in support of trade interests in the East Indies (Zemanek, 1999). The period also saw the development of the concept of territorial waters, perhaps as a result of incessant battles, along with protection of sea ports and coastal towns, and brought to prominence the canon shot rule[2] (three mile rule)(Schaffer, 1997).

2.2.2 Period 1800-1900

The realization of the importance of the concept of freedom of navigation dawned only two hundred years later in response to the needs of the European industrial powers for wider markets in Asia and Africa, as it was more useful to advocate open and free seas in order to exploit vast unexplored areas of the world which no nation could reach alone. The rapid advancement in technology, communication and infrastructure, including shipping, resulted in the creation of more demands in industrialized Western nations for raw materials, labour and access to markets for

[2] "Cannon Shot" doctrine. This doctrine holds that a coastal State enjoys sovereignty over the waters adjacent to its coastline as far seawards as the range of a cannon ball. Also known by its French name, portée du canon, this rule was favoured from 1610 until 1911 and reached its zenith during the period 1702 to 1793 available at http://cdserver2.ru.ac.za/cd/011120_1/Aqua/Marine%20Fisheries/ CHAP2/ CANON.HTM.

dumping surplus (Anand, 1973). Colonization of small or weaker nations was the name of the game. Following the defeat of Napoleon, Great Britain emerged stronger and was a leading nation in ocean commerce (McDowell & Gibbs, 1954/1999). The principle of freedom of the seas was actively practiced not only to allow free movement of merchant ships across the oceans in pursuit of trade and but also to advance military might to subjugate and colonize other people. The political climate in Europe allowed many nations like Germany, Italy, France and Netherlands to catch up with Britain. The United States also commenced the development of its shipping industry for greater access to markets (Fayle, 1933/2006). Japan also advanced, albeit late, but had considerably increased its influence after its war with China. This was also the time when sail ships were being replaced by larger and more powerful steam ships.

The period also witnessed the first international conference by maritime states in 1889 to discuss regulations on collision, vessel safety, uniformity in navigational marks and dangers and information sharing on weather (Stearns & Langer, 2001). The period from 1800 to 1900 witnessed unprecedented advancement in scientific, technical and commercial expertise related to oceans and also a sixteen fold increase in the world's import export trade over the previous century (Gold, 1981, p. 131). The free seas doctrine championed by Britain had by the end of the 19th century obtained universal approval through state practice (Butler & Maccoby, 2003).

2.2.3 Period 1900-1945

This period was the most chaotic in the modern era. The two world wars caused death and destruction to life and property all over the world and changed global power dimensions. The rivalry for world power carried along with an apocalyptic race for colonies and overseas markets, contributing largely to the outbreak of the First World War. A destructive prestige oriented ideology set the major powers on a collision course (Gold, 1981). The sea battles fought during World War I completely annihilated the freedoms of navigation and challenged the principles of international

law. The declaration of extended military zones, laying of mine fields and economic blockade by the British saw Germany unleash its submarine power against shipping of all kinds including merchant ships. The effectiveness of German submarine warfare, which wreaked havoc on the Royal Navy, sowed the seeds of a new dimension in the annals of the history of naval warfare, the beginning of submarine warfare (Heyman, 1997). The period between the First and Second World Wars witnessed greater involvement of governments in marine transport regulation and formulation of maritime policy in furtherance of political ambition. This interim period of peace was also a witness to the post war formation of the League of Nations and its dramatic collapse following the outbreak of the Second World War.

The League of Nations during its short existence adopted an agenda for discussions related to territorial water limits and a contiguous zone (Gold, 1981). During the intervening period between the two wars, the concept of freedom of seas existed in relatively uneasy peace but was far from an established principle of international law. This was so aptly true since seeds for the Second World War were already sown by the Treaty of Versailles and its inequality of disarmament principles (Gordon, 1999). The sea battles witnessed daring actions of German u-boats against both naval and commercial targets[3]. As in the previous war, the freedom of the seas was left to the mercy of the belligerents as commercial ships were targeted by both sides for strategic gains. The immediate post war results were dramatic. The Soviet Union and United States were favourably placed for becoming super powers, some new nations were formed, and many nations found new independence after being liberated from colonial rule (Stevens & Westcott, 1944).

[3] See Sinking of Athenia and Royal Oak available at http://www.uboataces.com/battle-athenia.shtml and http://www.uboataces.com/battle-scapa-flow6.shtml respectively.

2.2.4 Period 1945-1967

Towards the end of the Second World War and due to the failure of the League of Nations, the United Nations was born. The UN became an international forum for the Third World, or the developing nations, wherein these countries could voice their opinions and had scope for concerted action against big powers. The rivalry of the US and the erstwhile USSR engulfed the world on the brink of a Cold War. Nations rising from the aftermath of the Second World War continued their development aspirations, with new technology, scientific inquiry and space and ocean studies gathering momentum. Oil and gas became precious resources and their discovery in the high seas (then beyond 3nm) and its economic viability coupled with new trawling and fish finding techniques encouraged the technologically advanced nations to cash in on these resources. Japan and Russia (then USSR) developed their long distance fishing fleets including fish factory ships to process and preserve fish to increase their reach to distant fishing grounds especially off the coastal areas of Africa and Asia. The coastal states and especially the Latin American countries were alarmed by this intrusion (Anand, 1983). Following the Truman proclamation[4], three Latin American countries taking their cue from this proclamation, and with the aim of protecting their fisheries, came out with the Santiago declaration (UN Treaty series 14758, 1952)[5] in 1952 to claim exclusive jurisdiction up to 200 nm.

In 1948, the Intergovernmental Maritime Consultative Organisation or IMCO (now known as IMO) was formed to look into the aspects of ship safety and regulation of maritime transportation. International law development also started to take wings with the First and Second Law of the Sea Conferences in 1958 and 1960. The outcome of both conferences was a failure; however, Art. 2 of the Geneva Convention on the High Seas, 1958 recognized the regime of the high seas and the

[4] See the text of President Harry Truman‘s proclamation available at http://www.ibiblio.org/pha/policy/1945/450928a.html.

[5] Santiago Declaration by Peru, Ecuador and Chile and later by Costa Rica available at http://untreaty.un.org/unts/1_60000/28/18/00054896.pdf

freedoms governing the same including the freedom of navigation, fishing, over flight and laying of submarine cables. This was an important milestone in the history of international law as, for the first time, the freedom of the seas was codified (Oxman, 2006). Contrary to the euphoria following the milestone in the developed world, the aspect was seen with sceptism by most of the developing countries as it was the considered opinion of many of the newly independent nations that this legal freedom would allow developed nations to exploit their resources unflinchingly (Dean, 1958). Countries affected by Japan's long distance fishing fleets argued for extension of territorial waters from the then existing 3nm canon shot limit. The 1958 and 1960 conferences failed to decide on the limits of territorial waters (Churchill & Lowe, 1999). By the 1960s and early 1970s, however, the freedom of seas had lost its character as it became beneficial to the selected few that had the technology and capacity. The developing countries no longer considered the high seas freedom as freedom in the true sense; according to them, this concept had been wrongly interpreted by dominant naval powers to move across the open seas to threaten smaller states or use the concept as a convenience for subjugation and colonization (Stevens & Westcott, 1944). Many small nations were concerned that the concept of freedom of the seas had been transformed by the developed world as a license to overfish and pollute, in addition to gaining unrestricted access to other state's coastal areas.

2.2.5 Period 1967-1982

The year 1967 was an eventful year in the history of the law of the sea, first came the Torrey Canyon disaster which shook the world from its deep slumber on the impact of ship source oil pollution. The next was the Pardo Declaration. The Maltese ambassador Mr. Arvid Pardo's declaration to replace the concept of freedom of high seas with the principle of common heritage of mankind set the ball rolling for the formation of a sea bed committee to examine the legal regime of the deep sea bed (Baslar, 1998). This formation of a Sea Bed Authority set the foundations for the third UNCLOS, which held its first session in 1973. The conference was divided

into three committees each with a different agenda, thus there was a sea bed committee, maritime zones committee, which looked into territorial waters, contiguous zone, EEZ and the high seas, and a third committee which had the environment and scientific research as agenda items. During the negotiations a clear divide between developed nations that favoured freedom of navigation and developing nations that argued for extension of coastal state rights to end the laissez-faire regime on the high seas was very apparent.

The Third world countries (G-77[6]) stood together for regulation of freedom of seas doctrine and argued for more balance in order to safeguard their security and sovereignty interests. In 1982, when the conferences concluded the law of the seas had finally been codified. The end result was based on equity. The developing nations were able to extend their coastal state jurisdiction to 200 nm from their baselines with the establishment of the EEZ and the developed nations, due to incorporation of high seas rights in the EEZ clause, could also enjoy their freedom of navigation in these zones. Fishing freedom, which was prevalent in the past, was curtailed as a result of the third UNCLOS. The convention was open for signature for a period of two years at the end of which 159 states and the European Commission had become signatories (Churchill & Lowe, 1999).

2.2.6 Post UNCLOS 82

The practice of the freedom of the seas concept post UNCLOS 82 has generally been governed by the coastal state laws which in turn are broadly based on a state's interpretation of the international laws governing that domain. Under UNCLOS 82, the seas were divided into zones under varying degrees of coastal state control regime based on the distance of the area from the baseline as shown in Figure 1. This approach reflected the balance between the competing interests of coastal states and user states, which was the central issue of UNCLOS. The equitable distribution

[6] See Group of 77 available at http://www.g77.org/doc on G-77 which is the largest intergovernmental organization of developing states in the U.N.

envisaged an undisturbed seaborne trade and legal order to promote peaceful uses of seas and oceans since the total area of the EEZ of all the coastal states covered most of the routes used for international navigation (Kwiatkowska, 1989).

As regards the freedom of navigation through waters within the national jurisdiction of a coastal state, UNCLOS recognizes three kinds of rights of passage, namely innocent, transit and archipelagic sea lanes passage. All ships enjoy the right of innocent passage through territorial waters as long as the passage is expeditious and continuous and innocent within the meaning of the Convention.

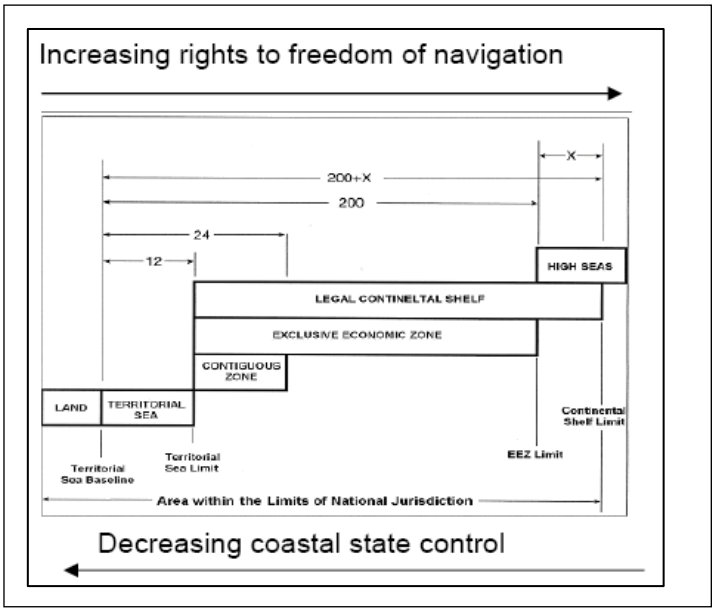

Figure 1[7] - Maritime Zones and Coastal State Jurisdiction

The coastal state has due jurisdiction to apply its laws and rules in relation to innocent passages; however, such laws and regulations, according to the Convention, should not hamper the freedom of navigation except in specified areas of

[7] Source : Kumar,B.V(2007). *Oceans and the Regulatory Framework*: *A techno-legal perspective*. http://drs.nio.org/drs/bitstream/2264/780/2/Refresher_Course_Mar_Geol_Geophys_2007_Lecture_Notes_14.pdf

archipelagic waters wherein a state can temporarily suspend innocent passage if the same is detrimental to its national security (Kwiatkowska, 1989).

Transit passage is the exercise of freedom of navigation solely for expeditious and continuous transit of straits that may lie between one area of the high seas or an EEZ and another area of the high seas or EEZ. Ships and aircraft exercising transit passage, however, have an obligation to refrain from any threat of use of force against the riparian state bordering such a strait (Agoes, 2000). The archipelagic sea lanes passage is a new concept in international law and is sui generis in nature wherein the waters are neither internal waters nor territorial sea, and hence sovereignty issues related to coastal states are subject to other rights enjoyed by third states.

Freedom of navigation as envisaged in UNCLOS 82 imposes no restriction on any vessel, except that it should not be engaged in piracy, slave trading, research, resource exploration or exploitation within the juridical waters of the coastal state without that coastal state's permission (Guy, 2005). Foreign warships enjoy the same freedom of navigation as merchant vessels and may conduct naval manoeuvres within the EEZ of any other state provided that such manoeuvres are not detrimental to the interests of the coastal state and the international community. States can lay pipelines, submarine cables and enjoy other uses of the sea within an EEZ, provided that they have due regard for the rights, laws and regulations of the coastal state and for freedom of navigation.

In practice, however, coastal states tend to interfere in the freedom of navigation sometimes in contravention of UNCLOS, based on threats posed either due to pollution or security or sometimes even both. Table 1 shows restrictions imposed by certain states on the freedom of navigation. Recent incidents mentioned in Table 2 have arisen because of the defensive attitude of the coastal state with respect to its

security and sovereignty against the freedom of navigation exercised by big powers (Valencia & Akimoto, 2006).

Post 9/11 with the advent of the ISPS Code, security issues have come to the fore. Somali piracy has also resulted in a severe erosion of the freedom of navigation wherein ships are no longer free to move as was possible two decades ago in those waters. Thus, the doctrine has faced challenges since its inception; however, it has survived this long in one form or another.

Table 1-Claims concerning freedom of navigation[8].

State	Instrument	Provision
Maldives	Maritime Zones of Maldives Act No. 6/96	Prior authorisation for the entry of all foreign vessels in its EEZ
Samoa	Act No. 18 of 25 August 1999	Right to regulate navigation in the EEZ
Belize	Maritime areas Act of 24 January 1992	Claims sovereign rights for the purpose of navigation with respect to fishing
Romania	Decree No. 142 of 25 April 1986	Claims jurisdiction over safety of navigation in the EEZ
Guyana	Act No. 10 of 30 June 1977	These states have promulgated their competence to designate areas in the EEZ where the entry and passage of foreign ships will be regulated by the establishment of fairways sealanes, traffic separation schemes
India	Act No. 80 of 28 May 1976	
Pakistan	Act of 22 December 1976	
Poland	Act of 21 March 1991	Right to establish zones unsafe for navigation
North Korea	Decree of 21 June 1977	50 n.m. military zone where navigation and overflight is to be exercised with the state's consent

[8] Source: Kopella, S. (2009, April). The territorialisation of the exclusive economic zone: implications for maritime jurisdiction. Paper presented at the international boundary research unit. Twentieth anniversary conference 2009. The state of sovereignty, Durham University. U.K.

Table 2-Recent list of security related major incidents[9]

INCIDENT	NATIONS INVOLVED
US Navy survey vessel Bowditch (Mar 2001) in Chinese EEZ	US and China
EP3 Surveillance and Chinese fighter crash(Apr 2001)	-do-
Japan Coast Guard pursuit ,firing and sinking of North Korean vessel (Dec 2001)	Japan and North Korea
Vietnam's protest against Chinese Navy manoeuvres and live firing exercise in its EEZ	China and Vietnam

2.3 Conclusion

The history of the law of the sea has witnessed battles, struggles and incidents between states in favour of and against the exercise of freedom of navigation. The concept continued to be used, abused and transformed as time went by until its codification. Freedom of navigation allowed trade and cultural exchange in the past, though colonisation and subjugation also took place in parallel. Prior to UNCLOS, freedom of navigation meant a laissez-faire license to pollute and overfish that eventually had to be regulated in order to sustain the ocean environment, peace and security of the world. According to Djalal (2009), the old freedom of navigation is an outdated concept as the oceans are being regulated to a greater extent now more than was done in the past, especially post UNCLOS. Security and environmental threats have come in the way of the doctrine of *mare liberum*. International conventions[10] and the designation of special areas have to a large extent regulated the past laissez-faire regime with respect to environmental concerns. Security issues, except in some few instances, did not largely interfere with the freedom of navigation until the ISPS regime came about in the aftermath of the 9/11 attacks.

[9] Source: Valencia, M.J and Akimoto, K (2006). Guidelines for navigation and overflight in the Exclusive economic zone, *Marine Policy 30*, 704-711.

[10] MARPOL, Dumping, Anti fouling, Ballast Water management, Basel, Ship recycling, OPRC and HNS.

The freedom of navigation has always faced challenges since its genesis. Nevertheless, it has managed to survive the long process of transformation and moulding through the passage of time.

Chapter 3

Concept of asymmetrical warfare, threats and maritime security

3.1 Introduction

In 1979 when Fredrick Forsyth published his novel "Devil's alternative" which described a terrorist threat to blow up a hijacked ultra large crude carrier carrying approximately one million tones of crude off the North Sea, if the terrorists' demands were not met, he was perhaps hinting at the most dynamic and yet elusive threat of asymmetric warfare likely to be employed by a terror organization against a state or many states. Fiction it was, but history is prudent to the fact that fictions of the past are the realities of the present as can be attributed to the Tom Clancy novels[11] foretelling a 9/11 incident back in the mid 90s. Asymmetric threat as a concept was not coined after 9/11; however, it definitely came into prominence after that incident when the World realized the potential dimensions of this kind of threat and the havoc it could cause.

3.2 Concept of asymmetric threats

Webster dictionary defines asymmetry as "not symmetrical" or "incommensurable". Asymmetric threats according to some military journals arise from threats of "not fighting fair" or attacking a weak point characterized as asymmetric warfare. Late US President John .F. Kennedy while addressing the West Point graduating class brought out the essence of typical asymmetric warfare when he said:

[11] Debt of Honor, (1994) and Executive decision (1996).

> *This is another type of war, new in its intensity, ancient in its origin—war by guerrillas, subversives, insurgents, assassins, war by ambush instead of by combat; by infiltration, instead of aggression, seeking victory by eroding and exhausting the enemy instead of engaging him. . . . It preys on economic unrest and ethnic conflicts…..* (Buffalo, 2006, p.1).

The important attributes of asymmetric threats can also be gleaned from Michael Rubin's statement where, according to him, the asymmetric threats:

> *……are not new, nor are strategists' attentions to them. In every era, from the pre-modern to the present day, weak forces utilize surprise, technology, innovative tactics, or what some might consider violations of military etiquette to challenge the strong.* (Rubin, 2007).

3.3 Asymmetric warfare[12]

One can characterize asymmetric warfare as a concept which is different from traditional warfare chiefly because of its manifestation in many forms making it all the more elusive. Traditional warfare is usually fought between nation states; however, asymmetric warfare can be carried out by non state actors. Asymmetric warfare has many synonyms and related terms such as guerrilla warfare, irregular warfare, low intensity conflict, proxy war and fourth generation warfare. Figure 2 highlights the contrasting aims of asymmetric warfare vis a vis conventional warfare.

[12]See Appendix 1 for more definitions of asymmetric warfare.

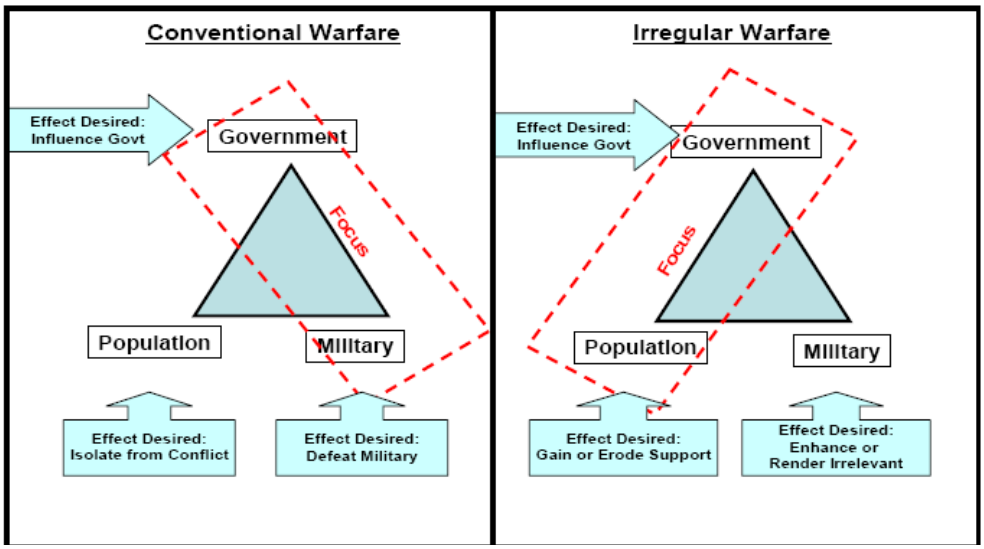

Figure 2-Contrast between conventional and asymmetric warfare[13]

Following the September 11 attacks, the U.S. has shown a greater interest in understanding and modifying its response to asymmetric warfare. Figure 3 represents the assumed operational risk from asymmetric threats arising from states like North Korea, China and Iran to the U.S. It is obvious from the figure that the operational risks from such covert operations involve maximum lethality and hence the U.S. has oriented its defence forces to prepare for asymmetric warfare (Applegate, 2001).

Notwithstanding the significant U.S. asymmetric threat related studies emanating from various state actors, contemporary writers generally include terrorism, guerrilla warfare, and WMD, cyber or information warfare, especially from non state actors as asymmetric threats (Blanck, 2003).

[13] Source: U.S. Department of Defense (2007, September 11). *Irregular warfare, a U.S. Joint operations concept* available at http://www.fas.org/irp/doddir/dod/iw-joc.pdf

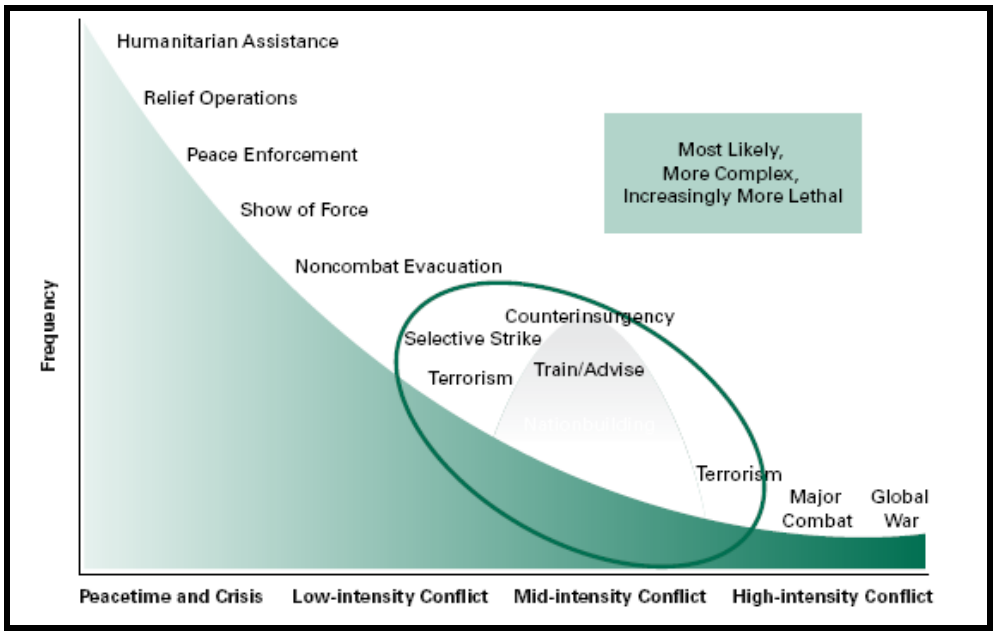

Figure 3-Spectrum of conflict[14]

3.4 Spectrum of asymmetric threats in maritime domain

World trade has grown consistently and over 90% of trade by volume is conducted through shipping (UNCTAD, 2009). The demand for goods and resources in one corner of the globe and excess supply in the other has allowed exchange of trade. Foreign trade became the engine of economic growth after the Second World War following diminishing trade barriers and opening of markets. The increased globalization of trade and commerce also brought with it, slowly but surely, increased globalised threat dimensions taking forms hitherto unconceived. Shipping today faces threats which are asymmetrical in construct and tactics. Risk intelligence[15] developed a four circles model (See Figure 4) for compartmentalizing

[14]Source: Hoffman, F.G. (2009). Hybrid threats: reconceptualising the evolving character of modern conflicts. *Strategic Forum, 240,*1.

[15]Risk Intelligence is a risk intelligence company consulting private and governmental clients on security threats and risks. Risk Intelligence has been specialising in analysing threats from and inter-action between piracy, organised crime, terrorism, insurgency and military conflicts since 2003.

maritime security threats for better assessment. The model (slightly modified by this author), according to Hansen (2009) reveals a trend whereby much of today's maritime crime is carried out by organized crime syndicates and insurgency groups. Risk intelligence has used the Four circles model to characterize the various threats in the maritime domain viz terrorism, piracy, insurgency and organized crime.

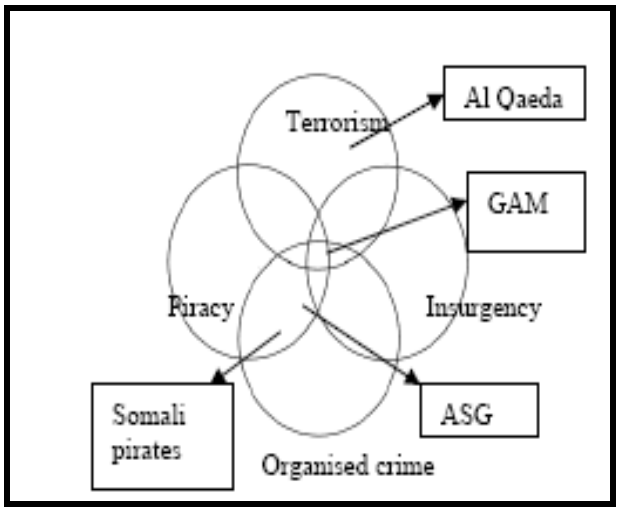

Figure 4-Four circles model[16]

3.4.1 Threats from terrorism

Terrorism is the form of violence that most closely integrates one sided violence against civilians with asymmetrical violent confrontation against a stronger opponent be it a state or group of states. The ultimate aim is not the killing of innocent civilians per se but through the terror such a deed generates; it destabilizes national or international public security for political gains (Stepanova, 2008).

[16] Source: Hansen, H.T. (2009). .Distinctions in the finer shades of grey: The four circles model for maritime security assessment. In Rupert Herbert Burns, Sam Bateman and Peter Lehr (eds). *Lloyds MIU handbook of maritime security* (pp.73-83). London: CRC Press.

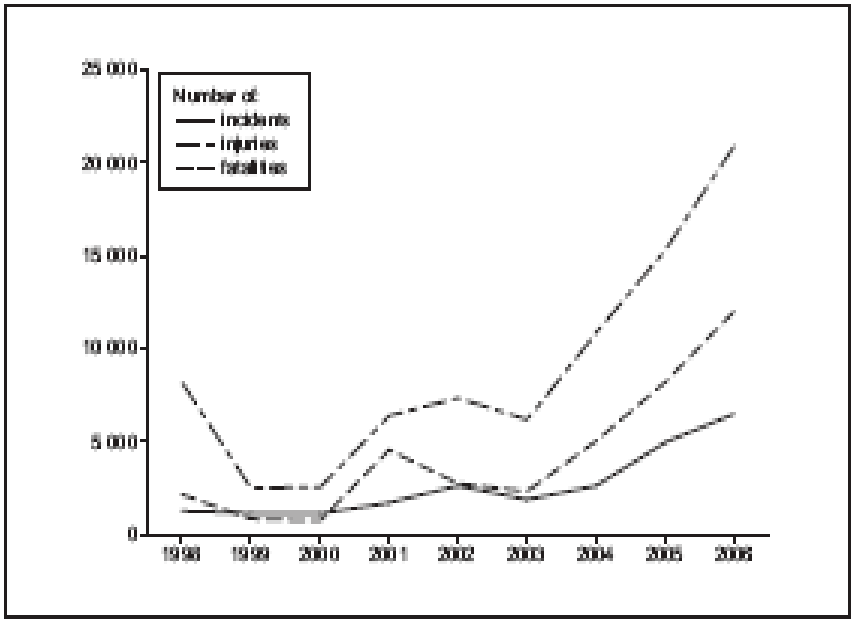

Figure 5-Worldwide terror incidents[17] (1996-2006)

The annual number of terrorist incidents from 1988-2006(Figure 5) has shown a steady increase with a particularly sharp rise from 2004-2006(mostly due to incidents in Iraq). Terrorism, despite its global presence, has no universally accepted definition,[18] possibly because of excessive politicization coupled with varying and diversified manifestations. However, since mass casualty (in terms of innocent civilians killed) is the primary source for attracting media attention, terrorists are mostly like to target non combatant or commercial buildings, infrastructure and public transportation. Further, as the state or states are the ultimate recipient of the terrorist's message, terrorists seek to employ the best possible way to wage a war against a state or states by resorting to the asymmetric nature of terrorism. The

[17] Source: Stepanova, E. (2008). Terrorism in Asymmetrical Conflict: Ideological and Structural Aspects. SIPRI research report # 23. Stockholm: Oxford University Press.

[18] See Eye on the UN (2010). U.N. has no definition of terrorism, where it is mentioned that UN has so far not been able to give definition of terrorism available at http://www.eyeontheun.org/facts .asp ?1=1&p=61

terrorists use asymmetric attacks against civilian targets as a force multiplier to compensate for their lack of military power against a state or group of states.

Maritime shipping and infrastructure, being one of the sources of a nation's commercial interest, also qualifies as a potential target of interest for terrorists. Terror attacks against maritime targets in the past have been quite diverse. Perpetrators of past incidents carried out attacks with differing motives. Some targeted cruise ships *(Santa Maria, Achille Lauro, City of Poros, Our Lady of Mediatrix* and *Super Ferry*) and merchant ships (*Coral Sea, Vory Limburg* and Sri Lankan tanker[19] and Cargo vessel *Ruhana* and *Nimalawa*) while others attacked military vessels (USS *Cole*, USS *Ashland,* Lankan Navy Dvora class Fast Attack Craft)(Hansen, 2009).

Maritime targets in comparison with terrestrial targets have been less attractive to terrorists in the past. This could be due to the complexity and capability that is required to carry out such an attack and the fact that impacts (publicity and media attention) from such attacks yield less mileage as compared to terrestrial ones. Statistics also bear witness to this, considering that of the total terrorist attacks world over in the last 30 years, only 2 % constitute as those against maritime targets (Greenberg, Chalk et al, 2006). In terror tactics, media attention is paramount since this is an effective way to spread fear, cause panic and instil distrust among citizens against the Government's abilities.

Despite all the above, following 9/11 and ever growing dependence on maritime trade world over, the perceived threats of maritime attacks have risen (Greenberg, Chalk et al, 2006). Maritime shipping is very vulnerable considering the growing volume of shipping traffic (6.7% as per UNCTAD, 2009), low crew complement and

[19] See Chronology of LTTE suicide bomb attacks for details on LTTE's suicide attacks available at *Society for peace, unity and human rights for Sri Lanka* web site http://www.spur.asn.au/chronology _of_ suicide_bomb_attacks_by_Tamil_Tigers_in_sri_Lanka.htm

restricted speeds due to congested choke points. Containerization has also brought the risk of WMD (weapon of mass destruction) proliferation, and biological or chemical attack. Offshore oil fields or oil platforms are also high interest targets as the destruction of these would put the world economy in chaos notwithstanding the environmental impact.

Asymmetric terrorist attacks against maritime targets can be realized by using explosives-laden suicide boats, light aircraft and gliders; merchant and cruise ships as guided missiles to ram another vessel, warship, port facility, or offshore platform; commercial vessels as launch platforms for missile attacks; underwater swimmers to infiltrate ports; and unmanned underwater explosive delivery vehicles. Further mines or vessel's legitimate cargo, such as chemicals, petroleum, or liquefied natural gas, can also be utilized as ingredients for explosion.

Globally, terrorists have shown an increasing interest in using small boats to attack military and commercial shipping and maritime facilities. The tactics and techniques of using small boats to emplace or deliver improvised explosive devices have proven effective and exportable (Carafano, 2007). Threats from small boats are very viable since they are simple, low cost and effective in evading detection or can act as perfect camouflage among groups of fishing or leisure vessels (Parfomak & Frittelli, 2007). The Mumbai 26/11[20] attacks bear testimony to the lurking danger posed by small boats to maritime security.

3.4.2 Threats from piracy

Piracy in the maritime domain has been an age old practice starting from the early days of seafaring. Julius Caesar was once captured and held captive by Cilicia

[20] See news item Terrorists in Mumbai attack arrive by boat. (2008, November 27). *IBI News* available at World Wide Web :http://www.ibinews.com/ibinews/newsdesk /20081027134010 ibinews.html

pirates. Piracy once flourished under state sponsorship under a different name, as privateering. King Henry III is known to be the first to give such licenses (O'Meara, 2007). Piracy, however, started declining by the beginning of the nineteenth century and by the twentieth century piracy was considered to be a thing of the past and mentions were found only in literary works. Post the Cold war era, maritime piracy surfaced again though it is suggested by analysts like Peter Lehr (2009) that the piratical attacks during the period of the Cold War could not succeed due to heavy patrolling of warships albeit for different reasons and not anti piracy. Modern Piracy is as complex as its definition. The International Maritime Bureau defines piracy as;

> *The act of boarding any vessel with intent to commit theft or any other crime and with an intent or capacity to use force in furtherance of that act* (IMB, 2010).

Piracy in accordance with Article 101 of UNCLOS is defined as:

> *Any illegal acts of violence or detention, or any act of depredation, committed for private ends by the crew or passengers of a private ship or private aircraft and directed:*
> *(a) On the high seas, against another ship or persons or property on board such ship;*
> *(b) Against a ship, persons or property in a place outside the jurisdiction of any State;*
> *Any act of voluntary participation in the operation of a ship or of an aircraft with knowledge of facts making it a pirate ship or aircraft;*
> *Any act of inciting or of intentionally facilitating an act described in the subparagraph a or b above.* (UN Convention on the Law of the Sea, 1982)

Piracy today is rampant around the Horn of Africa due to the Somali pirates, who have wreaked havoc on ships in the Gulf of Aden and beyond even 1000nm from the

shores of Somalia. The increasing range of piratical operations can be gleaned from the advisories issued by IMB[21]. Piracy in the Malacca Straits has declined due to effective patrolling by the Southeast Asian navies. Pirates today are heavily armed and possess sophisticated weaponry and equipment. They have automatic weapons; rocket propelled grenades, satellite phones and high powered outboard engines powering light agile fibre glass boats.

The Somali pirates operate with mother vessels which cater for their logistics and food thereby allowing them increased operational range and endurance to attack unarmed and innocent merchant ships with increasing success. Modern piracy is complex and multiphased. Piracy operations consist of an assemblage of three types of groups: (1) ex-fishermen who have intimate knowledge of the sea; (2) ex-militiamen who have manpower, strength and combat skills; and, (3) technical experts who can operate hi-tech equipment such as GPS systems and military hardware to assist with navigation and the detection of shipping targets. (Ross & David, 2009).

ICC International Maritime Bureau's Piracy Reporting Centre (IMB PRC) annual report indicates that in the year 2009, a total of 406 incidents of piracy and armed robbery were reported (IMB, 2010). The last time piracy figures surpassed 400 incidents was in 2003. The year 2009 was also the third successive year to report an increase in piratical incidents from the previous year. Figure 6 indicates the growing menace of maritime piracy in the recent years. Modern day piracy is a violent, bloody, ruthless practice and is being carried out with increasing expertise and range of operation making it another potent asymmetric threat in the maritime domain to reckon with.

[21] IMB warnings which required mariners to keep at least 50 nm off Somali coast in 2002 now recommends (as of April 2010) to keep off at least 600nm from that coast (IMB, 2010).

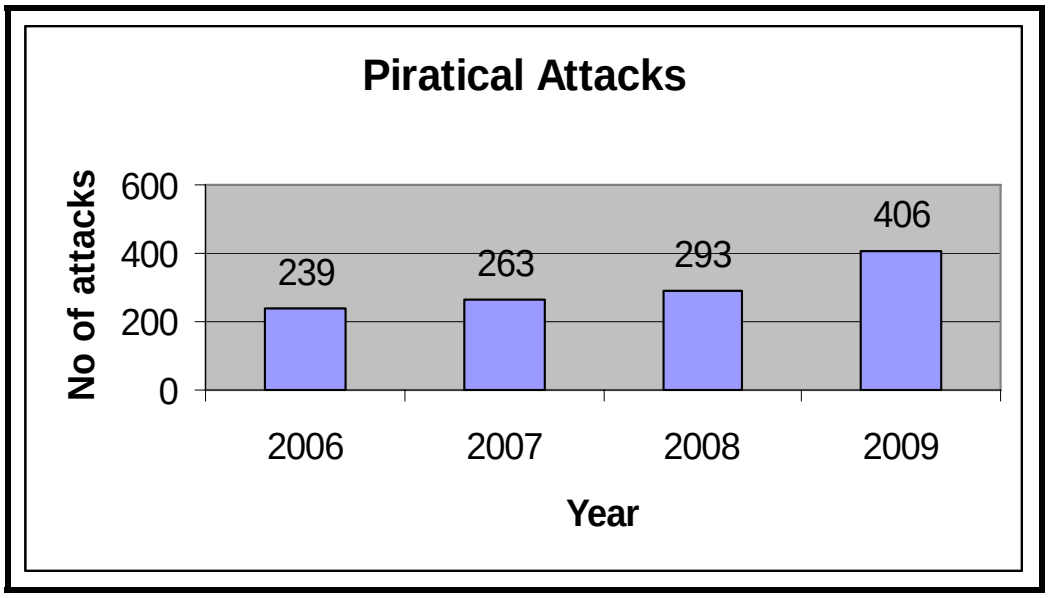

Figure 6-Piratical attacks 2006-2009[22].

3.4.3 Threats from insurgency

The dictionary[23] defines insurgency as

> *a condition of revolt against a government that is less than organized revolution and that is not recognized as belligerency*.

Insurgency matters to maritime security because of its relation to transnational terrorism. Insurgency groups like LTTE (Liberation Tigers of Tamil Eelam) though now a disbanded organization following the defeat and death of their Chief Prabhakaran against the Lankan army, have successfully carried out maritime attacks against Lankan naval ships and merchant ships in the past. Insurgents are a potent

[22] Source: International Maritime Bureau (2010). Piracy and armed robbery against ships annual report 01January-31 December 2009. Essex: ICC International Maritime Bureau.

[23] Source: *Merriam-Webster's Collegiate Dictionary*.(11eds)(2003) Springfield MA: Merriam Webster.

force as they have local support and this distinguishes them from terrorists. Insurgents, however, use terrorism as a tactic in the furtherance of their aim. Insurgent violence takes many forms. Table 3 [24] reflects the form and the characteristics associated with each.

Table 3-Forms of insurgent violence

Form of insurgency	Insurgency level	Number Involved	Struggle duration	Violence	Threat to regime	Spontaneity
Coup d'etat	High	Few	Short	Varies	Great	No
Leninist revolution	Low	Many	Short	Great	Great	No
Guerilla	Low	Medium	Long	Great	Varies	No
Riot	Low	Medium	Short	Little	Small	No
Terrorism	Low	Few	Long	Little	Small	Yes
Non – violent resistance	Low	Many	Long	No	Varies	No

As the ultimate goal of an insurgency is to challenge the existing government for control of all or a portion of its territory, or force political concessions into sharing political power, there is a tendency to use asymmetric warfare techniques against established power structures or infrastructure facilities such as ports or ships or offshore platforms. Most insurgency groups engage in arms, human and drug smuggling, counterfeit, fraud, money laundering, cargo theft and other maritime crimes in order to finance their activities (Hansen, 2009). The MIPT (Memorial Institute for Prevention of Terrorism) database (see Figure 7) has reflected steady growth in insurgent attacks and related fatalities world over. Due to the growing commercial importance of maritime infrastructures for a state's progress it is very likely that insurgents would target them. Thus, the security threat posed by

[24]Source: Merari, A.(1993). Terrorism as a Strategy of Insurgency. *Terrorism and Political Violence*. *5* (4), 213-251.

insurgency is yet another dimension of various asymmetric threats in the maritime domain (Hansen, 2009).

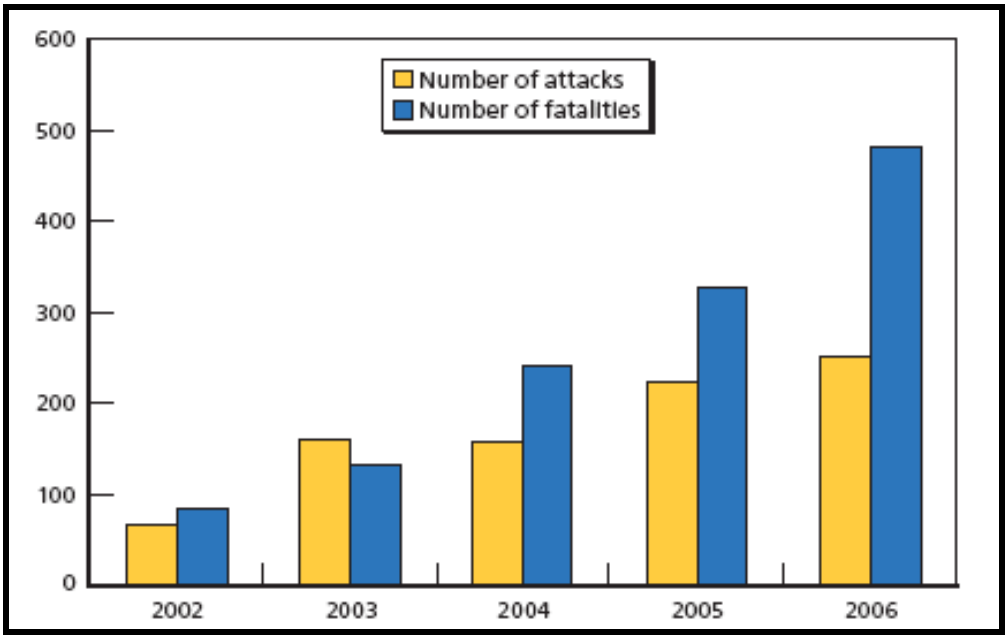

Figure 7-Insurgent attacks and fatalities (2002-2006) [25]

3.4.4 Threats from organised crime

United Nations Convention against Transnational Organized Crime (UNTOC) gives the definition of organized criminal groups as:

> *a structured group three or more persons, existing for a period of time and acting in concert with the aim of committing one or more serious crimes or offences established in accordance with this Convention, in order to obtain, directly or indirectly, financial or other material benefits*. (UN Convention against Transnational Organized Crime, 2000).

[25] Source: Gompert, et al (2008). War by other means: building complete and balanced capabilities for counter insurgency. Santa Monica: Rand Corporation.

Noting the threat posed by transnational organized crime, the UN Security Council in February 2010[26] noted with concern the serious threat posed to international security in different regions of the world and invited the Secretary-General of the United Nations to consider these threats as a factor in conflict prevention strategies, conflict analysis and integrated missions' assessment and planning. International organized criminals have evolved from traditional hierarchical structures to loose network structures. The clearest examples are found in countries where insurgents draw funds from taxing, or even managing organized criminal activities, particularly drug trafficking. Abu Sayyaf Group (ASG), an organized crime syndicate, bombed *Super ferry 14* killing 117 people in the year 2004 against non payment of extortion money by the ferry owners (UN Office on Drugs and Crime, 2010).

Piracy in Somalia is also an organized crime activity. Organized crime syndicates sometimes establish a pseudo state, as in Somalia, where rebels gain exclusive control of a portion of a country. The pseudo-states have no international accountability and, particularly when strategically placed, often become trafficking hubs and retail centres for all manner of illicit goods and services (Sorenson, 2008). They pose a threat to international security, providing a safe haven for international fugitives, including terrorists. It can thus be safely concluded from the foregoing that threat from organized crime syndicates is an important constituent to the dynamics of asymmetric threats in the maritime domain.

[26] See United Nation Office on Drugs and Crime (UNODC) (2010). The globalization of crime: A transnational organized crime threat assessment available at http://www.unodc.org/documents/data-and- analysis/tocta/TOCTA_Report_2010_low_res.pdf

3.5 Vulnerabilities and attractiveness of commercial shipping to asymmetric attacks

Of all the commercial shipping activities, container shipping, cruise and passenger liners, LNG, LPG, Chemical and Oil tankers are most vulnerable and at the same time attractive to extremists as targets for carrying out asymmetric attacks. The attractiveness and vulnerability of the vessels are based on the potential of each type of shipping to become a device, by its own means, to disrupt the mechanics of ocean trade and also facilitate mass casualty attacks.

3.5.1 Container vessels

Container shipping is a booming market and with growth rates as high as 12-13% the container shipping fleet is likely to double from present levels by 2016 (UNCTAD, 2009). As a result of its sheer volumes, and since every shipment involves many actors: the exporter, the importer, the freight forwarder, customs broker, excise inspector, truckers, railroad workers, dock workers, stevedores and also the crews of vessels involved, container shipping represents a viable conduit for covert operations for launching an asymmetric attack. According to Rand Corporation data (Greenberg et al, 2006), approximately 112,000 merchant vessels, 6,500 ports and harbour facilities, and 45,000 shipping bureaus constitute the contemporary international maritime transport system, linking roughly 225 coastal nations, dependent territories, and island states.

This complex web of international trade offers a huge and daunting challenge to security personnel for ensuring comprehensive checks and most of the containers transit ports without getting scanned. Even in countries like the U.S. with advanced x-ray and gamma scanning technologies, the container inspection rate is only about 10%, which equates to a scanning rate of one per ten (Block, 2006).

Table 4-Summary of consequence-Container ship. [27]

Maritime Scenario	Human consequences	Economic consequences	Administrative consequences	Intangible consequences
Sinking or destruction in a channel or port or strait	Injuries or death to crew of ship and ships in immediate vicinity	Depending upon the type of the ship and the value of cargo.	Salvage and channel clearance. Security issues and port vulnerability.	Loss of human and material capital. Disruption to trade.
Hijacking a ship to use it for suicide attacks	Death and destruction of life and property both onboard and the target structure or facility	Depending upon the facility attacked, scale of damage and the type of ship involved.	Media attention, fear among public, Security vulnerability, supply chain disruptions. Disaster relief and rescue	Loss of human and material capital. Disruption to trade. Social disharmony.
Using ship as a platform for delivery of WMD	Innumerable deaths and destruction of life and property both onboard and the target facility	Depending upon the facility attacked, scale of damage and the type of ship involved.	Destabilize government, Very large scale media attention, greater fear among public, Security vulnerability, supply chain disruptions. Disaster relief and rescue. Contamination and other health issues.	Lack of faith in government, power struggles, blame game and possible retaliation. Large scale losses of human and material capital. Disruption to trade. Social disharmony.

Container shipping and the intermodal transport network system associated with it is very ubiquitous and pervasive and hence terrorists may view it as an unparalleled avenue to transport WMD or explosives to any part of the world. In the absence of uniform and comprehensive security regimes in the supply chain activity concerning containers coupled with rudimentary technology being availed of by most countries with regard to locks for sealing containers, it is not surprising that container vessels are considered Trojan horses for covert terrorist logistics operations (Chalk, 2009).
Table 4 above presents a possible summary of consequences relating to asymmetric threats from container vessels. Based on the tangible and intangible consequences, one can easily fathom the clear attractiveness of these Trojan horses to terrorists.

[27] Source: Greenberg, M., Chalk, P., Khilko.I, Ortiz, D.S., & Willis, H. H. (2006). Maritime terrorism: risk and liability. Santa Monica: Rand Corporation.

3.5.2 Cruise vessels

The *Achille Lauro* attack signifies the historic link between cruise vessels and terrorism. Cruise shipping even in this modern age is considered a luxury and domain of the elite hence while being a global industry; it is quite geographically and economically concentrated. Cruise ships have very particular characteristics that qualify them as highly potential targets to terrorists. Today's cruise liners boast carrying capacities of over 5000 (*Oasis of the Seas*) [28] making them single geographical spaces ideally suited for mass casualty attacks. An attack on such iconic vessels involving mass casualties would result in tremendous international media attention of the type seen after the terrorist attack of Mumbai 26/11 and piratical attack on *Seabourn Spirit*.

Such large scale publicity is crucial to the business of international terrorism to demonstrate the operational capability of a particular terrorist outfit, spread panic and fear among local population, facilitate economic loss (like scaring away investment and tourism) and generate lack of faith among populations in their governments' ability to protect them.

The vulnerability of cruise ships arises from the lack of rigorous baggage and personnel screening (only 2% are physically inspected), non vetting of support staff associated with the cruise business (mainly dockworkers /casual labourers hired on daily basis), prolonged stops at anchorages for passenger sightseeing and publicly available fixed itineraries (Chalk, 2009). These factors make these ships highly vulnerable to terrorist attacks. Table 5 lists the consequences arising out of a possible terrorist attack on a cruise ship.

[28] See Oasis of the Seas. (n.d.). *Royal Caribbean International* available at http://www.royalcaribbean.com/findacruise/ships/class/ship/home.do?shipCode=OA

Table 5-Summary of consequence-Cruise ships[29]

Maritime Terrorism Scenario	Potential Human Consequences	Potential Economic Consequences	Potential Intangible Consequences
Hijack ship at sea		Hundreds of millions of dollars in life and injury compensation and restoration / provision of infrastructure and new security arrangements	Loss of human capital.
Ram ship in port with IED	Hundreds to thousands of fatalities and injuries	-do-	Loss of human capital.
Suicide dive bomber or limpet mine attack	Hundreds to thousands of fatalities and injuries	-do-	Loss of human capital.
Suicide bombing on ship at port or sea	Hundreds to thousands of fatalities and injuries	-do-	Loss of human capital.
Standoff mortar or grenade launcher attack	Hundreds to thousands of fatalities and injuries	-do-	Loss of human capital.
Biological attack on ship food or water	Hundreds to thousands of fatalities and injuries	-do-	Loss of human capital.

3.5.3 Passenger ferries

The bombing by Abu Sayyaf Group of *Super ferry-14*, which killed 116 passengers, perhaps best exemplifies terrorists' interest in these kinds of vessels. Though not belonging to the same iconic and illustrious class as cruise vessels, the passenger ferries do constitute almost the same economic value as that associated with container shipping. The human factor increases its value further since an attack against a passenger ferry will definitely kill more people than an attack on a container vessel. The vulnerability of ferries to terrorists generates from the lack of

[29]Greenberg, et al (2006), supra note 27.

comprehensive security cover due to high volumes of traffic, limited time in port for more trips to and fro, almost nil baggage or vehicle checks, limited vetting of onboard and associated staff as most are employed on seasonal and adhoc basis to cater for workloads during peak tourist season. Moreover like cruise vessels, ferries have fixed itineraries and routes. Some ferry operators publicly publish the complete layout of the ferry which makes it convenient for an extremist outfit to devise plans for carrying out a clandestine attack targeting maximum casualties. Table 6,[30] shown below, reflects the likely scenarios and their consequence.

Table 6-Summary of consequence -Passenger ferry

Maritime Terrorism Scenario	Potential Human Consequences	Potential Economic Consequences	Potential Intangible Consequences
Hijack ship at sea		Hundreds of millions of dollars in life and injury compensation and restoration / provision of infrastructure and new security arrangements	Loss of human capital.
Ram ship in port with IED	Fatalities and injuries in hundreds	-do-	Loss of human capital.
Suicide dive bomber or limpet mine attack	Fatalities and injuries in hundreds	-do-	Loss of human capital.
Suicide bombing on ship at port or sea	Fatalities and injuries in hundreds	-do-	Loss of human capital.
Standoff mortar or grenade launcher attack	Fatalities and injuries in hundreds	-do-	Loss of human capital.

[30] Source : Greenberg et al (2006), supra note 27.

3.5.4 LPG, LNG and oil tankers

According to World Energy Outlook 2009, fossil fuel remains the most dominant source of primary energy accounting for 75% of global energy needs for the period 2006-2030 (International Energy Agency, 2009). Energy is very critical to a nation's infrastructure and growth. It is a nation's lifeline and hence has been considered as a key strategic target since the First World War. Wars have also been fought in the past in order to gain control over oil resources so as to have energy security. Nations continue to explore alternate resources to compensate this dwindling reservoir of black gold; however, the rising demand in this sector has also provided the requisite boost to its transportation. LPG,LNG and Product carriers are all associated with the carriage of inflammable and potentially explosive cargoes thus making them score high on the terrorist list of desirable targets as can be made out from the attack on MT *Limburg* and the latest incident (if confirmed[31]) related to MT *M Star.*

Sea trade of crude oil accounts for two thirds of tanker cargoes i.e. out of 2.75 billion tonnes of tanker cargo, 1.83 tonnes constitutes crude oil (UNCTAD, 2009). This outright majority outlines the inescapable strategic importance of this trade to the global economy. Tankers like VLCCs and ULCCs are iconic structures and, therefore, the cargoes they carry are also of huge capital interest to terrorists and pirates alike. Product tankers when loaded with volatile cargo are more vulnerable to terrorist attacks due to the explosive nature of the cargo carried (Burns, 2009). Fully laden tankers have limitations in manoeuvrability and are usually slow; as a result they are targets of opportunity for terrorists. Further, the low freeboard and highly volatile cargo are a bonus to any terrorist group planning such an attack. The latest

[31] See Calvo, A (2010, August 10). M stands for mystery. *Pan Orient News* available at http://www.panorientnews.com/en/news.php?k=284. *M Star*, a Japanese VLCC tanker, was damaged by an explosion July 28, 2010 off UAE. Early reports suggested terror attack however local sources have denied the same. Clearer picture will only emerge after detailed investigations.

IMB statistics[32] indicate that piratical attacks tend to be slightly more frequent than those against Bulk carriers (117 tankers[33]/109 bulk carriers). Tankers carrying out underway replenishment or ship to ship transfer virtually become sitting ducks because of their restricted ability to manoeuvre under these conditions. Tankers, thus, are undoubtedly prize targets considering the scale of the potential catastrophe (see Table 7) that can be caused by the cargo they carry.

Table 7-Summary of consequence-Oil, chemical and product carrier

Maritime Terrorism Scenario	Potential Human Consequences	Potential Economic Consequences	Potential Intangible Consequences
Hijack tanker at sea.	Possible death or injuries to crew	Hundreds of millions of dollars in life and injury compensation and restoration / provision of infrastructure and new security arrangements. Catastrophic environment damage if scuttled or damaged. Huge costs for restoration of environment.	Loss of human capital and marine environment
Ram tanker in port	Fatalities and injuries in hundreds	-do-	Loss of human capital and marine environment
Suicide dive bomber or limpet mine attack	Fatalities and injuries in hundreds	-do-	Loss of human capital and marine environment
Suicide bombing on tanker at port or sea	Fatalities and Injuries in hundreds and oil fire hazard in port.	-do-	Loss of human capital and marine environment
Standoff mortar or grenade launcher attack	Fatalities and Injuries in hundreds. Environment damage.	-do-	Loss of human capital and marine environment

[32] International Maritime Bureau (2010). Piracy and armed robbery against ships annual report 01 January-31 December 2009. Essex: ICC International Maritime Bureau .

[33] Tankers include all kinds including product, chemical, LNG/LPG and bitumen tanker.

3.6 Conclusion

Asymmetric threats in the maritime domain appear too remote based on statistics and the incident profile so far; so was 9/11 before it actually happened. Asymmetry is an important concept as a strategy in modern times. Asymmetric threats are real, dynamic and elusive. Asymmetric attacks against vulnerable maritime targets, especially shipping, though infrequent and dispersed cannot be ignored. Even though the actors staging asymmetric deeds may be pirates, terrorists, crime syndicates or insurgent groups, the tactics employed and the deeds done are bound to be similar at least in terms of consequence. It is thus important to understand the organisation and capability of the perpetrators in order to assess the threat they pose and to measure the adequacy of counter strategy.

Chapter 4

Maritime Asymmetric attacks: organizations, capability and network

4.1 Introduction

Maritime security threats as discussed in the previous chapters basically emanate from activities of terrorists, pirates, organized crime syndicates and insurgents. Armed robbery or coastal zone piracy incidents are also included as part of the overall threats from pirates. These agents of asymmetric threats, based on their type, idiosyncrasy, location and capability, operate differently and hence the security risk from each also varies considerably. Writers and analysts have indicated that despite 9/11 and Osama Bin Laden's threats to cut off the lifelines of the global economy, there have been no major strikes against maritime targets as very few terror organizations have the inclination or capability to strike at sea (Lehr, 2009).

However, the growing range of operations of Somali pirates, who strike at ships underway as far as 1000 nm from the coast even while in the presence of the conglomeration of the World's best Navies, should not be taken lightly. This chapter discusses organizational networks of terror organizations/syndicates or groups, their maritime capability, modus operandi, sources of funding and possible nexus with each other for mutual benefit.

4.2 Terrorist organisation

Most terror groups do not have maritime capability because operations at sea require minimum attributes or skills as a mariner, the basics of which are boat or ship handling, survival at sea and seamanship. Further, in order to be able to carry out subsurface suicide or underwater attacks, the terrorists need to be qualified in scuba diving and be experts in underwater explosion or else at least must have some basic training in these aspects. These are formidable obstacles which require additional funding, infrastructure and greater inclination. Some terrorists' organizations like ASG overcame these obstacles by diversifying their operations i.e. operating crime syndicates for running piracy, extortion, narcotics, money fraud or hawala transactions, cyber crimes related to illegal activities to fund their major operations (Banlaoi, 2005). There are others that approach or cooperate with other crime organizations or syndicate or insurgency groups on a mutual interest basis for training facilities and resources. Any terror outfit that is capable of planning and executing asymmetric attacks, furthering strategic partnerships and cooperating with other groups must have a fully functional organizational matrix.

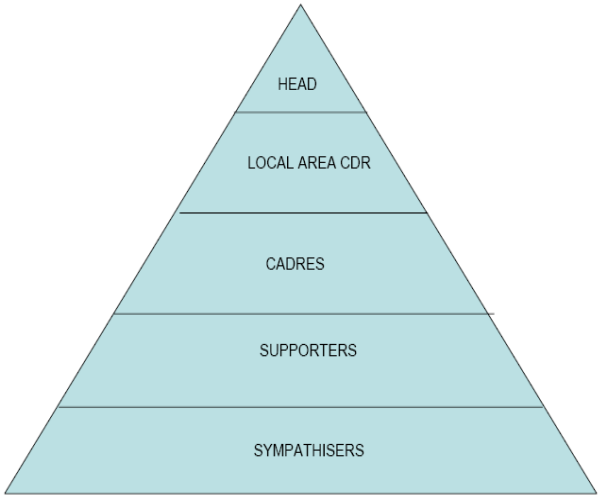

Figure 8-Typical terrorist organisational setup

Some terror groups have very complex networks, intermixed with the local population thus making it difficult for security forces to identify them and take preventive measures. Most traditional terror groups in the past have followed the typical hierarchical model as shown in Figure 8. However, modern terror groups engaged in asymmetric warfare have incorporated the cellular network which is difficult to impregnate and at the same time effective in carrying out attacks covertly (Decision Support System Inc, 2001).

4.3 Categories of terrorist organisations

Globally, terror organizations are differentiated into various categories based on specific criteria. Terror organisations can be categorised in differing ways. The U.S. military guide categorises terrorist groups as those coming under ideological, motivational and geographical categories. The ideological categories describe the political, religious or social orientation groups of terrorists. Motivational categories cover separatist, ethnocentric, nationalistic and revolutionary types of terrorist groups. Domestic and international terrorism fall under the geographical category of terrorist groups (Stepanova, 2008).

Functionally, modern terrorism is categorised into classic peace time (leftist and right wing terrorism), conflict related (Chechen, Kashmiri, Palestinian and Tamil) and super terrorism (Al-Qaida's global jihad) (Stepanova, 2008). It is very important to have complete knowledge about the category and objective of any terror group in order to contain its local/national/international conglomerations. Understanding the mindset of any terror group is pertinent to analysis and mitigation of the type of risk emanating from that organisation or group as terror groups tend to be copy cats i.e. they usually carry out types of attacks which have been proven to be successful elsewhere by them or their networked groups (Lehr,2009).

The proliferation of terror knowledge is usually shared among groups having common objectives or goals or interests as many groups do not have the type of capability to carry out a large scale attack in every sphere. This lack of capability in carrying out a particular type of attack is compensated for by exchange of expertise through the terror network. Maritime terror capability, particularly involving ships and boats, is one such attribute.

4.4 Terrorist organisations having maritime capability

Operating at sea as discussed in chapter 3, is quite complex and requires terrorists to possess decent mariner skills and some familiarity with handling ships or boats. Notwithstanding the skills required, there exist quite a handful of terror groups that have developed this capability and pose a credible threat to maritime assets. A description of some of the infamous terror groups that have developed maritime capability or have used maritime targets to strike terror in the past are mentioned below:

4.4.1 Al-Qaeda(AQ)

4.4.1.1 **Description**

Al Qaeda was founded by Osama Bin Laden in 1988 with Arabs to fight against former Soviet occupation.

4.4.1.2 **Maritime capability**

The organisation carried out the bombings of USS *Cole* and *Limburg* in 2000 and 2003. Its recent plans to attack shipping targets in the Suez Canal were foiled by Egyptian authorities (International Institute of Counter Terrorism, 2009).

4.4.2 Al-Shabab

4.4.2.1 **Description**

Al-Shabaab (aka the Harakat Shabaab al-Mujahidin, al-Shabab, Shabaab, the Youth, Mujahidin al-Shabaab Movement, Mujahideen Youth Movement) is an Islamic organization that controls much of southern Somalia, excluding the capital,

Mogadishu. It has waged an insurgency against Somalia's transitional government and its Ethiopian supporters since 2006. Shabaab is nominally led by Sheikh Mohamed Mukhtar Abdirahman "Abu Zubeyr," though experts say a core group of senior leaders guide its actions (Hanson, 2010).

4.4.2.2 **Maritime Capability**

Al-Shabaab has been linked to Somali pirates and also Al Qaeda. The organisation is yet to carry out any attacks against maritime targets. However, the organisation has controls over those regions of Somalia where pirates are thriving, pointing to an alleged linkup with piracy as an offshoot for financing its insurgency operations. Further Al Qaeda‘s presence and training activities with Al Shabaab in Somalia have also been endorsed by the Prime Minister of the Transitional Federal Government of Somalia (Sharmarke, 2009).

4.4.3 ASG

4.4.3.1 **Description**

Abu Sayyaf, whose name means "bearer of the sword" in Arabic, is a militant organization based in the southern Philippines. It seeks a separate Islamic state for the country's Muslim minority. Its first leader was Abdurajak Janjalani, a Philippine Muslim who fought in the international Islamist brigade in Afghanistan during the Soviet occupation (Cronin, Aden et al, 2004).

4.4.3.2 **Maritime Capability**

The Abu Sayyaf Group carried out bombing attacks against MV *Doulos* in 1991 and *Super ferry 14* in 2004. The group is also famous for carrying out kidnap for ransom (Banlaoi, 2005).

4.4.4 Hezbollah

4.4.4.1 **Description**

Established in 1982 by Lebanese Shiite clerics and ideologically inspired by the Iranian revolution, Hezbollah was formed in response to the Israeli invasion of Lebanon (Cronin, Aden et al, 2004).

4.4.4.2 **Maritime Capability**

Hezbollah attacked the Israeli container port of Ashdod in 2004 and in July 2006, Hezbollah attacked and destroyed an Israeli naval corvette by C-802 guided missiles (Richardson, 2006 a).

4.4.5 JI

4.4.5.1 **Description**

Jemaah Islamiya(JI) is a radical Islamic group that aims to create a strict Islamic state in place of Indonesia, Malaysia, Singapore, the southern Philippine islands, and southern Thailand (Cronin, Aden et al, 2004).

4.4.5.2 **Maritime Capability**

JI is yet to be associated with any maritime attacks; however, it was revealed that in 2001 the organization aimed to bomb visiting U.S. Naval warships. Further evidence obtained in 2007 suggested that the Organisation had conducted training to develop underwater destruction capability (Raymond, 2007).

4.4.6 L e T

4.4.6.1 **Description**

Lashkar-e-Tayyiba (LeT) is a radical Islamic group in Pakistan that seeks to establish Islamic rule throughout South Asia. Although primarily focused on freeing Kashmir from Indian control and establishing an Islamic state there, the group has also suggested that it aims to establish Islamic rule over all of India as well(Cronin, Aden et al, 2004).

4.4.6.2 **Maritime Capability**

The Mumbai 26 November 2008 attacks were carried out by LeT using asymmetric amphibious warfare through the use of small boats. New Yorker journalist Steve Coll (2008) has testified to being a passenger in LeT's pontoon boat fleets during 2005 earthquake in Kashmir.

4.4.7 LTTE

4.4.7.1 **Description**

The LTTE is a Tamil separatist group in Sri Lanka that aimed to establish an independent Tamil state including the ethnically Tamil regions of the island. The Liberation Tigers of Tamil Eelam were founded by Vellupillai Prabhakaran and arose in the 1970s as the strongest of a number of Tamil groups opposing discrimination against Tamils by the dominant Sinhalese ethnic group (Cronin, Aden et al, 2004). Following his death in May 2009, the LTTE became a disbanded organization with some of its cadres managing to escape to India and countries in South East Asia, Europe and North American countries.

4.4.7.2 **Maritime Capability**

The LTTE raised Sea Tigers and Black Tiger squads to carry out several successful attacks against Sri Lankan Naval vessels and a few commercial shipping vessels. They targeted Lankan naval and commercial ships using surface and subsurface vessels[34]. The Organisation was also actively engaged in sea piracy[35], hijack and used hijacked vessels as phantom vessels for smuggling narcotics weapons and other illegal stores.

4.5 Piracy, terrorism, organised crime and insurgency nexus

Terror operations, like any military operation, require adequate human, material and financial resources for sustenance. Many terror and insurgency groups resort to various forms of criminal activity in order to finance their operations as well as to run their organisations. Terror operations unlike insurgency are generally cheap and

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[34] See Chronology of suicide bomb attacks by LTTE available at *Society for peace, unity and human rights for Sri Lanka* web site http://www.spur.asn.au/ chronology _ of _suicide_bomb_attacks_by _Tamil _Tigers_in_sri_Lanka.htm.

[35] See the LTTE in brief. (n.d.). *Permanent Mission of Sri Lanka to the United Nations Office at Geneva* available at World Wide Web:http://www.defence.lk /pps / LTTE in brief.pdf
.

hence easy to finance. Table 8[36] provides approximate data on costs incurred by terror groups to carry out world famous terror conspiracies.

Table 8-Cost (approx) for terror attacks

Attack	Date	Cost Estimate
London transport system	July 7, 2005	GBP 8000(UK Home office)
Madrid train bombings	March 11, 2004	USD 10000
Istanbul truck bomb attacks	15 & 20 November 2003	USD 40000
Jakarta JW Marriot Hotel bombing	August 05, 2003	USD 30000
Bali bombings	October 12, 2002	USD 50000
USS Cole attack	October 12, 2000	USD 10000
East Africa embassy bombings	August 07, 1998	USD 50000

Terror organisations sometimes use undercover or complicit charities and businesses to support their causes. However, illegal and money laundering activities are also being resorted to by terrorists, organised crime syndicates and insurgency groups alike in order to generate finances. Groups like Hezbollah and Al Qaeda have been suspected to resort to illicit diamond trading to generate funds whilst groups like the Taliban have been linked to the drugs trade (Moller, 2009). LTTE (Greenberg et al, 2006) and ASG (Merrari, 1993) are known to use extortion, sea piracy and drugs trade to generate finances. Al Shabaab, the Somali insurgent group has reportedly established a protection fund for pirates wherein 5-10% of ransom money is being paid by the pirates to operate from the territory controlled by Al Shabaab. Reports of Al Shabaab using pirates to train its militia men to form an independent maritime force provide fodder for a possible terrorism piracy nexus (Mendez, 2009). It is thus not inconceivable that, for financial benefit, terrorists may use all possible means to generate finances including approaching pirates or even resorting to piracy; however, considering the fundamental incompatibility between the objective interests of

[36] Source: Terrorist financing. (2008, February 29). OECD Financial action task force report available at World Wide Web:http://www.fatf-gafi.org/dataoecd /28/43/40285899.pdf. All cost estimates except London bombings from UN monitoring team on Al Qaeda and Taliban.

terrorists and pirates, such a marriage of convenience may not have a long term perspective.

4.6 Modus operandi

Modern terrorists in order to make more and more audacious attacks, have used improvised explosive devices (IEDs) and Vehicle (Vessel) borne improvised explosive devices. The use of COTS (commercially available off the shelf) equipment makes it more complex and intriguing. The use of IEDs or VBIEDs in terror attacks are called low impact high probability attacks, which is asymmetric attack at its best (Lehr, 2009). The smuggling of IEDs on board ships is more probable than smuggling WMDs. The *Superferry-14* bombing by ASG was accomplished by placing an IED inside a television. Another variant of a maritime IED attack was used by Shite insurgents against British Royal Marines by exploding the device kept in the end of a pier where the river patrol had to pass (Lehr, 2009). A LTTE VBIED, (Vessel or Vehicle borne improvised explosive device) as shown in the Figure 9[37] was actively used to carry out its suicide sub- surface attacks against maritime targets. There is also significant risk from remotely operated underwater vehicles and underwater divers using autonomous underwater vehicles or diver driven vehicles. These devices are COTS equipment and can be purchased by anybody.

[37]Source: LTTE chronology Supra note 34.

Figure 9-LTTE suicide VBIED

4.7 Conclusion

Asymmetric threats emanating from terrorists, pirates, insurgents and organised crime syndicates or from a joint nexus of these evil forces through proliferation of terror knowledge, offer low cost, high probability options to these perpetrators. The IEDs and VBIEDs made from COTS equipment and carried onboard ships hidden in daily-use, common house hold items indicates the range of improvisation of explosive options available for carrying out varying types of asymmetric attacks. The maritime states must never take chances with these threats. Rather, they must continuously develop strong counter strategies through maritime security initiatives and domain awareness tools to deter such attacks, taking obvious cognizance of the fact that certain tough countermeasures can also be detrimental to the freedom of navigation principles.

Chapter 5

Threat countermeasures and impacts on navigational freedoms

5.1 Introduction

Asymmetric threats in the maritime domain whether due to piracy, terrorism, organised crime or insurgency are all forms of violent interference to the freedom of navigation. Curbing these violent manifestations of modern day maritime crime calls for effective countermeasures. These countermeasures are constituted by international Conventions and resolutions, regulations arising out of the law of the land, surveillance including intelligence gathering activities and effective law enforcement mechanisms. UNCLOS 82, often referred to as the constitution of the oceans (Koh, 1982) addressed only the piratical forms of asymmetric threats and due to it being hugely silent on other forms of asymmetric threats including terrorism, maritime nations looked for solutions through newer security initiatives following terror attacks on the *Achille Lauro* and the World Trade Centre. This chapter analyses the important international maritime security initiatives, UN Security Council Resolutions, surveillance/domain awareness and their impacts on navigational freedoms.

5.2 International Ship and Port facility Security Code

The ISPS Code was brought in by the IMO (International Maritime Organisation) following the September 11 attack as a comprehensive security regime to enhance maritime security and came into force on 01 July 2004. The Code, incorporated as an

additional chapter XI-2 (Special measures to enhance maritime security) to SOLAS 74 (International Convention for the Safety of Life at Sea as amended), consists of two parts: A and B. Part A is compulsory and part B consists of recommendatory guidelines. The U.S., however, has made it mandatory for all foreign as well as its national ships to comply with the part B guideline. The European Union has also made some sections of part 'B' as mandatory for its member states (Mazaheri, 2008). The Code applies to cargo and passenger ships of gross tonnage over 500 tons, including high speed crafts, mobile offshore drilling units and port facilities serving such ships engaged in international voyage.

5.2.1 Working of the Code

In order to ensure compliance, all state parties are required by the Code to certify the qualification of the ship security officer (SSO), issue ISSC (international ship security certificate) and approve the ship security plan (SSP) in respect of each ship flying their respective flag. The flag state administration is also required to set the level of security for its fleet in general and for each port facility to be visited by its fleet. Once the ship approaches a particular port, it is tracked and its identity verified for grant of access. The ship then calls at the port and the PFSO (port facility security officer) of that port may visit onboard to check documents and level of security. The ship has to show a continuous synopsis record (CSR) for its last ten voyages, cargo manifests, crew lists, and other security related information to the PFSO. This is the standard practice for a compliant ship. In case of a non compliant ship, access may or may not be granted to enter the port depending upon the policy measures being enforced at that particular port.

5.2.2 ISPS Code and asymmetric threats

It can be debated whether the ISPS Code fully addresses the asymmetric threat element; however, because of the enhanced security culture, the Code, might address threats through a preventative and mitigative angle. Undoubtedly the Code is a

preventive mechanism to deter terror outfits from gaining easy access to maritime facilities like ports, ships and mobile offshore drilling units. The Code requires the ship(facility) to have a security plan in place to deter unauthorised access, enhanced vigilance and appropriate training of crew so that preventive measures can be taken whilst in passage or in an area of terror hotspots. Notwithstanding the foregoing, this aspect, which is its over reliance on a ship's unarmed and non combatant crew to mount the first line of defence against an asymmetric attack, has been considered as its biggest drawback.

Further, the Code not only fails to cater for threats arising from small boats, fishing vessels or vessels with gross tonnage less than 500, but also is not mandatory for vessels not engaged in international voyage. These are the kinds of vessels that can be used by terrorists to gain access to a moving ship or worse as suicide crafts. They can also be used as secondary targets to blow up an oil platform, port or harbour facility. The Code is also grossly silent on piracy, and the facility response measures against such, or terror attacks (Chawla, 2004). The piracy attacks off the Gulf of Aden have continued unabated even though ships attacked are fully ISPS compliant. The ISPS Code, though introduced hastily, was sold to the shipping industry on the premise that it would address the threat of terrorism; however, six years later, the reality is far from that envisaged. Today terrorism is a far cry for the shipping industry as it continues to grapple with immediate challenges from piracy and armed robbery at sea (Raymond & Morrien, 2009). The ISPS Code thus has to be considered only as a procedural safeguard or bench mark standard for maritime security and not as a mechanism to address all the threats concerning multimodal transport and supply chain activities.

5.2.3 ISPS and navigational freedoms

The ISPS Code mandates that maritime administrations set security levels for each and every port depending upon the perceived threats. In cases where ships have lower security standards than the level expected by the Contracting Government of

the port of call, the ship is required to comply with the requirements of that Contracting Government or else it will face an entry ban to that particular port due to compliance failure (Bazan, 2007). Further, in case a compliant ship calls at a non compliant port and thereafter calls at a compliant port, the ship is subject to greater scrutiny or may even be denied entry because of the security compromise or possible contamination based on ISPS standards.

Let us consider a hypothetical situation to analyse practically the impediments to a vessel due to a terror incident onboard. Suppose on passage from the Persian Gulf to Amsterdam off the Bay of Biscay, the crew of a Polish tanker accidently detect the presence of a WMD device in the pump room. The Master activates the SSAS signal and it is received by the flag administration in Warsaw. The flag administration, considering the urgency of the situation, informs the Master to seek the assistance of the coastal state, in this case, France. The coastal state considering the potential danger of a WMD device can always deny a place of refuge (*Erika and Prestige* incident) owing to the threat from the bomb to its public and can also order the ship to keep out of its territorial waters. Requests for refuge may also be turned down by other coastal states like the Netherlands, Spain and Britain considering the threat. In the event of such a scenario the navigational freedoms of the ship may be severely restricted. Sometimes the situation may not improve even if the device is removed safely, as the fact that the ship's security was indeed compromised would portray a general lack of security standards which would entail undue restriction to the ship at its NPC (next port of call) and further subsequent calls at other ports even though the ship may be fully compliant with the Code.

5.3 Suppression of unlawful acts against safety of maritime navigation (SUA 1988 and 2005 Protocol)

SUA 1988 was drafted by the legal committee of the IMO as an aftermath to the hijacking of Italian flagged cruise ship *Achille Lauro* in 1985. The Convention

defines unlawful acts and obliges state parties to either extradite or prosecute the alleged offenders.

5.3.1 SUA Protocols

SUA treaties of 1988 were developed to deal with terrorist acts due to the mention of terrorism in its preamble; however, the act itself shied away from mentioning it within the text. Following the 9/11 incident, the IMO adopted Assembly resolution A.924 (22)[38] to review, with the intent to revise, existing international legal and technical measures, and to consider appropriate new measures to prevent and suppress terrorism against ships and to improve security onboard and ashore, in order to reduce the risk to passengers, crews and port personnel on board ships and in port areas and to the vessels and their cargoes (IMO, 2001). This led to the adoption of the 2005 SUA Protocols which sought to supplement the 1988 SUA Treaties by strengthening the legal framework to deal with acts that threaten the safety of maritime navigation and effectively punish the perpetrators (Mbiah, 2007). The 2005 Protocols introduced four sub groups of new offences through Article 3bis, namely offences with terror motives, transport offences, nuclear proliferation and offences of assistance to fugitives.

Thus, the new Protocol considers using or discharging explosives, radioactive materials, biological, chemical and nuclear weapons against a ship or from a ship, discharging oil, LNG and HNS, using the ship in a manner causing death or serious injury or damage as offences for criminal prosecution (Young, 2009). The Protocol has also incorporated provisions for boarding at sea through Article 8bis wherein a state party can board a vessel flying the flag of another state seaward of the outer limits of its territorial sea or in its EEZ with express permission from the flag state.

[38] International Maritime Organisation. (2001, November 20). Review of measures and procedures to prevent acts of terrorism which threaten the security of passengers and crews and the safety of ships. (Resolution A.924 (22)).

Such boarding can also take place in the case that there is no response within four hours from the flag state. The boarding provisions, however, have been balanced by safeguards to prevent their abuse. The extradition provisions have also been modified to outlaw political offence as defence (Mbiah, 2007).

5.3.2 Effectiveness of SUA against asymmetric threats

The status of the 1988 SUA Convention and its Protocol with respect to contracting states is 156 states (94.73% of world tonnage) and 145 states (89.56% of world tonnage) respectively. The status of the 2005 SUA Convention and its Protocol is 16 states (7.6% world tonnage) and 12 states (6.87%) respectively as of 31 Jul 2010 (IMO, 2010).[39] The Convention has come into force as of July 28, 2010; however, the overall effectiveness of the 2005 SUA Protocol depends upon its ratification by all states. The principle aim of the SUA Convention is to suppress terrorism as can be gleaned from the teleological interpretation of its Preamble. The 2005 Protocol addresses terror threats emanating out of WMD and BCN weapons effectively; however, it has its own constraints.

The unlawfulness of any act under SUA is contingent on that act endangering or compromising the safety of navigation thus limiting its applicability to a great extent. This limitation must be removed to make the act more functional and dynamic. Further, due to its anti terror orientation SUA does not include acts motivated by *animo furandi* (intent to plunder) or *lucri causa* (for the sake of financial gain). Thus acts of coastal zone piracy,[40] which may also include drug trafficking, are not actually criminalised under SUA, if the same does not hinder the safety of navigation (Mejia & Mukherjee, 2006). Also according to Robert Beckman (2009), SUA 2005 may not be of assistance in combating all forms of maritime terrorism, especially

[39]International Maritime Organisation (2010, July 31). *Status of Conventions* available at http://www.imo.org/conventions/mainframe.asp?topic_id=247

[40] Coastal Zone Piracy refers to piratical acts taking place within the coastal zone of a state.

from those emanating out of rogue states that, for obvious reasons, may not become party to the Convention. The fact that boarding actions if deemed unfounded will entail compensation may also act as a deterrent to enforcement in the absence of strong intelligence (Spadi, 2006). Notwithstanding the constraints mentioned in this paragraph, the 2005 SUA Protocol is definitely a step in the right direction to bolster the fight against terrorism and elements of asymmetric threats.

5.3.3 SUA and navigational freedom

The 2005 SUA Protocol has come into force only recently and hence the use and misuse of the boarding provisions mentioned in the Protocol have not yet come to light. The IMO Legal Committee during its 88th session recognised the possible interference to freedom of navigation through the boarding provisions. During the course of negotiation the following was stated:

> *The inclusion of boarding provisions constituted a significant departure from the fundamental principles of freedom of navigation on the high seas and exclusive jurisdiction of flag states over their vessels. It was accepted that the principle of flag state jurisdiction must be respected to the utmost extent, recognized in that a boarding by another state on the high seas could only take place in exceptional circumstances. Any exception must be precise, unambiguous and internationally accepted* (IMO, 2004). [41]

The incorporation of flag state express approval and also the four hour rule give prominence to flag state jurisdiction and protection of navigational freedom to an extent; however, the underlying fact remains that interdiction and boarding with or without consent do restrict the free movement of shipping. The Protocol's reference

[41] International Maritime Organisation. (2004, May 18). *Report of the Legal Committee on the work of its eighty-eighth session, agenda item 13*.

to other international Conventions and regimes that prohibit transport of particular materials complicates the matter further as identifying the criminal character of the material concerned would require a subjective or objective assessment including a determination of whether the concerned states have included the Conventions in the list whilst applying the SUA Protocols in order to ascertain the criminality of material (Chai, 2007).

The Protocol also creates legal uncertainty on matters regarding the release of toxic materials from ships as it fails to aptly quantify or classify materials as for criminal purposes for obvious reasons because there are many chemicals which have dual or multiple uses and hence classifying them as criminal under SUA would severely impact the global chemical business. This legal uncertainty would make the enforcement agencies of the states concerned the final arbiters in construing and applying the Protocol and hence situations wherein *naughty*[42] states trying to interfere in peaceful movement of goods and persons at sea or the freedom of navigation cannot be ruled out in future(Chai, 2007).

5.4 Proliferation Security Initiative (PSI)

The proliferation security initiative is an initiative by the United States to establish a coalition of willing partners to respond to the proliferation of WMD. The PSI is outside the concept of treaty and is to be understood as a framework for international cooperation to deal with the proliferation of WMD (Beckman, 2005). The PSI was announced in 2003 by then American President George .W. Bush in Poland.

[42] The term naughty states has been used by Prof Lee Sik Chai, Chairman of IMO Legal committee, as an obvious reference to rogue states that constantly abuse or distort international law for their advantage.

5.4.1 Endorsement to PSI

When a country endorses PSI, it endorses the PSI Statement of Interdiction Principles (SIP), which commits participants to establish a more coordinated and effective basis through which to impede and stop WMD, their delivery systems, and related items (U.S. Department of State, 2007). The countries commit to the following:

1. Interdict transfers to and from states and non-state actors of proliferation concern to the extent of their capabilities and legal authorities;
2. Develop procedures to facilitate exchange of information with other countries;
3. Strengthen national legal authorities to facilitate interdiction and take specific actions in support of interdiction efforts.

5.4.2 Scope and legal status of PSI

The main objective of PSI is to impede and stop shipments of WMD, WMD delivery systems and related materials flowing to and from states and non state actors of proliferation concern (Thomas, 2009). PSI has the support of ninety seven states as of 06 Aug 2010.[43] The states participating in PSI are not treaty bound but they do make political commitments to act in accordance with the SIP. The PSI is a highly selective non proliferation initiative based on unilateral action of a state against another state or non state actor emanating out of unilateral threat perception of that participating state. This unilateral determination which can be politically motivated or based on assumed threat perception of proliferation allows the participating state to interdict the ship of any state or a particular target state or non state actor (Thomas, 2009).

[43] See information on status of PSI membership available at World Wide Web: http://www.state.gov /r / pa/prs/ps/2010/06/142823.htm. Status as on August 06, 2010.

Such unilateral actions can be seen as threat of use of force by the victim state citing violation of the provisions of Art 2(4) of U.N. Charter[44] according to which no state can indulge in the threat of use of force against the territorial integrity and political independence of another state. In the 2005 SUA Protocol, the boarding provisions of PSI were included by the PSI states to match the SIP and legalise the PSI boarding; however, based on the general desire to preserve the freedom of navigation, express approval of flag states was included as one of the mandatory conditions. The U.S. in its efforts to enforce PSI has entered into bilateral boarding agreements with some of the PSI participating states which allow the U.S. to board a ship of a third state under the authorisation of a state party to the agreement. Though the SIP indicates that the boarding provisions are conducted in accordance with international law, the state practice, however, has been to reposition the international law to legitimise the PSI as can be garnered by the inclusion of PSI boarding provisions in the 2005 SUA Protocol (Spadi, 2006; Prosser & Scoville, 2004).

5.4.3 PSI and asymmetric threats

PSI has no institutional structure as it is a political commitment by participating states. PSI has, however, generated a growing practice of bilateral and multilateral agreements in support of interdictions of foreign flagged vessels suspected of carrying WMD, WMD devices or related material in spite of the lack of any legal authority for the same in UNCLOS (Thomas, 2009). Foreign naval forces or coast guards can only stop and search a foreign flagged ship on the high seas under specific narrowly defined circumstances mentioned under UNCLOS Art 110. PSI participants would not have the authority to stop the vessel of another state that is not a PSI participant, and doing so could be seen as an act of war (Thomas, 2009). PSI success can only be gauged once it is legitimised and universally accepted. However,

[44] See charter of the United Nations available at http://www.un.org/en/documents /charter /chapter 1. shtml

John Bolton (2004)[45] attributed PSI as instrumental in Libya's denouncement of its WMD programme. PSI's legality was underpinned by UN Security Council Resolution 1540 (Richardson, 2006b) and more recently by the coming into force of the SUA Protocol of 2005. Out of 192 UN member states, 97 have already endorsed PSI and it is slowly but surely advancing to attain its global reach, which will mean universal acceptance to actions that previously would have only been undertaken during war.

Logistically, too, there are many difficulties that must be worked through. Detecting small amounts of nuclear materials can be very challenging. It is easy to imagine the diplomatic uproar if a ship was stopped under the PSI based on a false reading (Richardson, 2006b; Coyle & Samson, 2009). Finally, proper disposition of the goods seized under the PSI is also unclear. With the nebulous haze surrounding the PSI, it is possible that a potential participant could decide against taking steps to stop a ship presumed to have a WMD load (Thomas, 2009). These legal aspects cast a cloud on the PSI's capability to address the WMD proliferation and the asymmetric threat of its use by terrorists. Notwithstanding the legality concepts and the problems associated with the PSI, the initiative can definitely play a greater role in prohibiting proliferation of WMD and its systems into wrong hands. Effective intelligence sharing, non proliferation cooperation agreements and legal interdictions can help reform the international security system so as to enable it to meet the asymmetric challenges of the 21st century.

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[45] Bolton, J. (2004, September 7). All out war on proliferation. *Financial Times* .available at http://merln.ndu.edu/archivepdf/wmd/State/36035.pdf. He claimed that [I]nterception, in cooperation with the U.K., Germany, and Italy, of the *BBC China*, a vessel loaded with nuclear-related components, helped convince Libya that the days of undisturbed accumulation of WMD were over, and helped unravel A.Q. Khan's network.

5.4.4 PSI and navigational freedoms

Moves for the acceptance of the principles represented in the PSI, as part of the larger body of international law, are manifested the most, in attempts to relegate the existing regime on freedom of navigation envisaged under UNCLOS. The SIP provisions of interdiction and boarding of vessels suspected to carry WMD is not authorised under Art 110 of UNCLOS. The extension of SIP of PSI to contiguous zone is also not in accordance with the UNCLOS as the rights of a flag state in internal, territorial and contiguous zones of a coastal state are totally different. States enjoy full criminal jurisdiction over all ships in their internal waters as can be gleaned by international acceptance of port state controls.

In territorial waters, ships of all states are subject to coastal state laws but they also enjoy the right of innocent passage. The criminal jurisdiction of a coastal state cannot be enforced on transiting foreign vessels except under the conditions listed in Art 27(1) of UNCLOS which does not include WMD. Undoubtedly any interdiction and boarding in territorial waters based on PSI constitutes a denial of innocent passage and further, the same, if carried out in contiguous zone, is detrimental to high seas freedom of navigation enjoyed by all states. Thus it is reasonable to assume that boarding provisions of PSI as stipulated by SIP will have impacts on the navigational freedoms envisaged in UNCLOS.

5.5 Maritime domain awareness (MDA)[46]

Asymmetric threats, as brought out earlier, are very dynamic and most elusive. Maritime security initiatives can only be effective so long as there is a continuous flow of actionable intelligence coupled with constant risk assessment and development of strategy to counter these threats. Maritime domain awareness

[46] The MDA according to U.S. National Plan to Achieve Maritime Domain Awareness has been defined as the effective understanding of anything associated with the maritime domain that could impact the security, safety, economy, or environment of the United States.

(MDA) is, therefore, all about generating actionable intelligence. MDA, a term coined by the U.S. Coast Guard in late 1990s (Murphy, 2009), came into prominence as an initiative of the U.S. following the September 11 attacks to counter maritime terror threats and for effective law enforcement at sea. Though initially a U.S. initiative, today its relevance as a source for information and early warning is found in the doctrines of most of the world's navies and coastguards (Roman, 2009). Maritime shipping[47] today is international and very complex. The complexities pose a real challenge to law enforcement agencies universally especially when threat assessment is based on selective targeting. Tools like MDA are therefore required to understand the risk emanating from or to various maritime targets.

5.5.1 Achieving MDA

MDA involves the integration of global maritime intelligence (GMI) and global maritime situational awareness (GMSA). GMI[48] is the product of legacy as well as changing intelligence capabilities, policies and operational relationships used to integrate all available data, information and intelligence in order to identify, locate, and track potential threats to maritime interests. GMSA[49] results from persistent monitoring of maritime activities in such a way that trends can be identified and anomalies detected. So MDA= GMI + GMSA. However, fundamental to MDA is tracking, which involves the monitoring of vessels and the vessels' cargo, crews, and

[47] The ship can be flagged in one country, bareboat chartered by a company belonging to another country, time or voyage chartered by another entity belonging to some other country, manned by crew from different parts of the world and can be carrying cargo for companies or individuals based in various other ports of the world.

[48] See information on the U.S. national strategy for maritime security: global maritime intelligence plan (2005) available at the World Wide Web: http://www.fas.org/irp/offdocs/nspd/gmii-plan.pdf.

[49] The U.S. national concept of operations for maritime domain awareness defines GMSA as the comprehensive fusion of data from every agency and by every nation to improve knowledge of the maritime domain.

passengers, to rapidly generate geo-locating information on vessels of interest. The tracking loop process is as illustrated in Figure10.

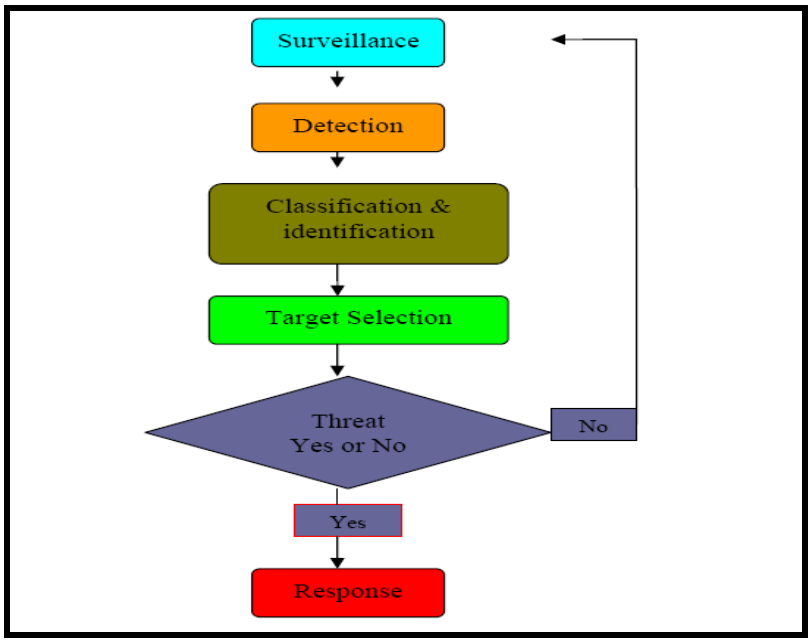

Figure 10-MDA tracking loop

MDA, developed by the U.S., follows a layered defence model (see Figure 11) representing a screen formation in which all vessels are tracked with improved timelines as they approach the coast. Threats being asymmetric and uncertain, the aim of tracking is to account for each and every vessel in the surveillance domain or the area of interest. The U.S. MDIZ (maritime detection and identification zone) extends to 2000nm.[50]

[50] United States CG has incorporated mandatory 96 hour notice of arrival for foreign ships entering U.S. ports following the September 11 attacks. 2000 nm consideration is based on ships operating at average speed of 20 knots for 96 hours.

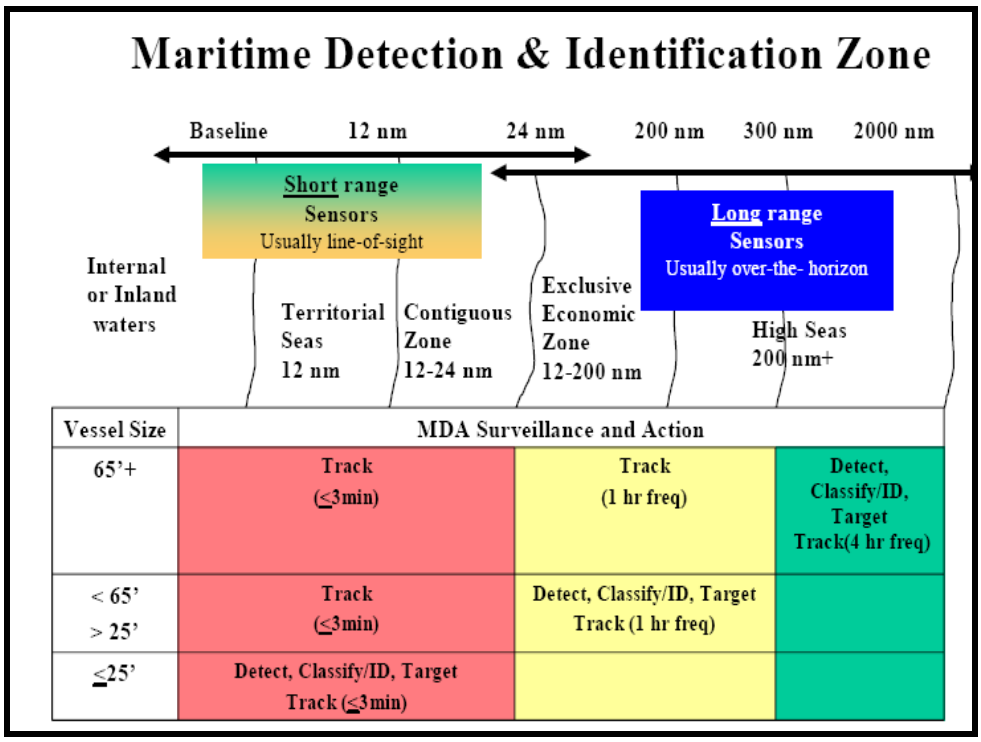

Figure 11-U.S. MDA detection and indentification zone [51].

MDA intelligence gathering activities also include HUMINT (intelligence from human agents or sources), ELINT (intelligence from electronic sources) and financial intelligence apart from inputs from various tracking networks like AIS and LRIT. The possible inputs to MDA compiled by this author are as surmised in Table 9.

[51] Source: Watts, R. B. (2006). Implementing maritime domain awareness. (Master's thesis). Naval Postgraduate School. California: U.S.

Table 9-MDA input data

Data Source	Inputs to MDA
Vessels	Flag, type, tonnage, maximum speed, origin, and track.
Cargo	Shipment origin, type and quantity of cargo including details from CBRN and explosives sensors and detectors
Vessel crews and passengers	Crew, dockworkers, and passengers
Surveillance area	Geographic points such as sea lanes or oceanic regions. Ports, waterways, and facilities including critical areas like nuclear power plants, rail heads, transportation nodes, bridges, and undersea fiber optic cables and pipelines
Environment	Weather, currents, natural resources, fish stocks
Financial transactions	Illegal money trails, money laundering, hidden vessel or cargo ownership.
Risk information	Identified threats and inherently dangerous activities such as illegal migration, drug or arms smuggling or offshore drilling. Operational information on military, federal, state, local, and/or allied assets or hostile forces operating in the maritime domain.

The tracking of ships is the primary component of any MDA. Considering the sheer volume of commercial traffic today and the contemporary threat environment posed by an elusive enemy in the form of asymmetric threats, it leaves a state with no choice other than to be critically aware and knowledgeable in terms of movements of shipping in near real time in its maritime domain. Presently the task of tracking merchant shipping is based on ship reporting systems (example AMVER, INDSAR and AUSREP for search and rescue efforts), automatic identification system (AIS) (initially adopted by IMO for vessel traffic management) and long range identification and tracking (LRIT).

5.5.2 MDA tracking challenges

The MDA concepts use AIS [52] and LRIT [53] inputs for vessel tracking and surveillance. The grey areas in tracking emanating from AIS and LRIT can impact

[52] See Appendix 2 for information on AIS.

[53] See Appendix 2 for information on LRIT.

the MDA as wrong inputs lead to wrong assessment and thus wrong action. AIS data, as shown in Figure 12, are received by the shore monitoring station and integrated into the maritime domain awareness system. LRIT data is obtained either through International data exchange or national /regional data centre.

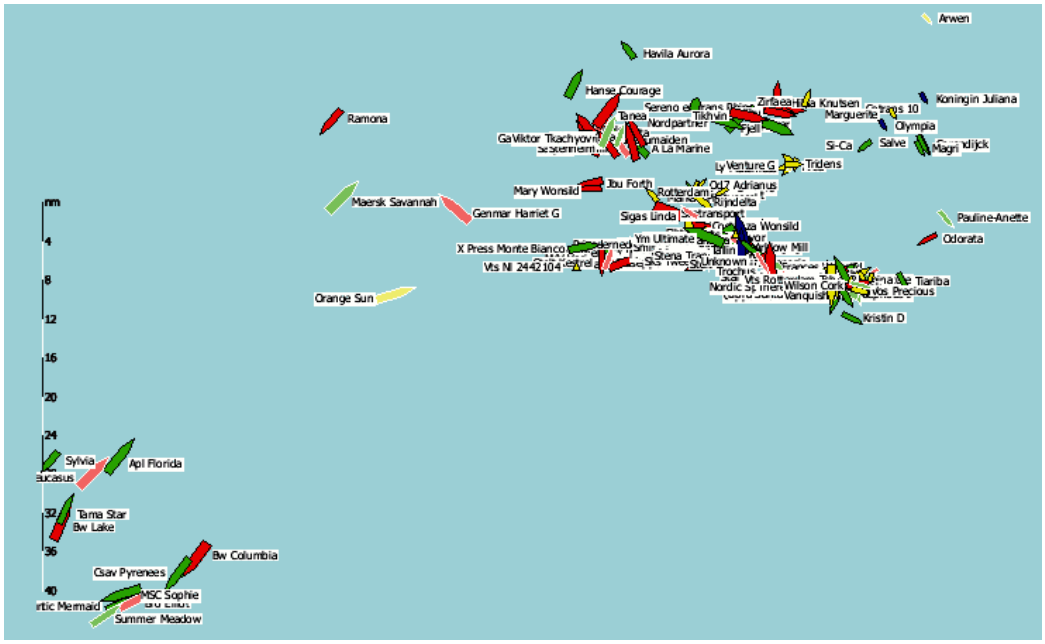

Figure 12-AIS picture of Rotterdam [54](12:35 UTC, July12, 2010)

AIS data can be classified into static, dynamic and voyage as reflected in Table 10 (Mokhtari, Wall, Brooks & Wang, 2007). The problems with the AIS can be separately categorised under navigational and security domains. Navigation related problems include faulty static data; incorrect dynamic data and incorrect heading include faulty static data. The AIS requires certain static inputs and voyage related data for correct transmission of data; however, in some cases due to incorrect static data entry false data is transmitted (Norris, 2010). The incorrect dynamic data results when non compliant GPS units are set up on differing datum (other than WGS 84)

[54] See Rotterdam AIS live picture available at the World Wide Web: http://www.shipais.com /currentmap.php?map=Rotterdam#.

resulting in wayward positions and incorrect data. Non interface of ship's heading indicator to digital interface can result in a mismatch between heading and course over ground leading to incorrect heading (Norris, 2010).

Table 10-Data Exchanged by AIS

Information	Details
Static	IMO and MMSI numbers, Call sign, Name, Type, Length and beam, onboard location of position fixing antenna.
Dynamic	Ship's position with accuracy indication and integrity status, Time in UTC, Course over ground, Speed over ground, Heading, Navigational status (NUC, CBD etc).Rate of turn angle of heel pitch and roll etc .
Voyage	Draught, Cargo type, Destination and ETA, Route waypoints and POB.

Note: Green highlighted data are optional.

Security related problems from AIS could arise from its non applicability to the small boats, open broadcasts, false data, non transmission and jamming. AIS are not mandatory for vessels under 300 GT and hence these vessels can move about the surveillance area undetected. Asymmetric threats from such small boats can pose a serious challenge to maritime security as these vessels could carry out *Limburg* and USS *Cole* type bombings undetected. Further, AIS signals are broadcast openly and receivers are available off the shelf in commercial markets very cheaply. Thus it is not impossible for terrorists or insurgents or even pirates to mount selective attacks against high value vessels or those carrying potentially dangerous cargo (Kraska & Wilson, 2008).

Security threats can also emanate from deliberate false transmissions. The IMO[55] and Lloyds MIU intelligence (Murphy, 2009) have recorded examples wherein AIS equipment fitted on vessels has been configured to transmit false data about the ship especially by ships in piracy prone areas hence one cannot rule out the use of similar tactics by terrorists or pirates to carryout their attacks. Furthermore, Nautical Institute[56] reports of AIS data showed duplicate identity i.e. two ships transmitting the same identity.

Another key issue is that AIS data transmits only when it is switched on hence if the terrorists or pirates switch off the system upon boarding then the data will not be transmitted thus causing problems for tracking and detection in the MDA. Finally, there are also reports of AIS frequency being shared among non maritime users like taxi drivers in some parts of U.S. (Murphy, 2009; Kraska, 2009). This can become a problem in the future, if the same lands in the hands of pirates or terrorists who can use it to jam or even hack into MDA networks.

As regards the LRIT, it is a satellite based restricted information distribution system which is compatible with INMARSAT –C, Mini –C and D+ terminal. LRIT equipment transmits a very restricted range of information (ship's identity position, date and time of position) every six hours. Similar to AIS, LRIT has its own pros and cons. Apart from cost and infrastructure, there are issues such as sovereignty, sailing history, small boats and cyber threats (Verma, 2009). In the LRIT system, states can request information from any data centre; however, in absence of any binding agreement or Convention, states may refuse such information citing sovereignty issues. Also, the LRIT system does not generate reports that include a ship's previous sailing history. This can be a serious obstacle for carrying out security risk assessment and selective targeting based on such assessments. Further, as in the case

[55] International Maritime Organisation (2010, April 28). *AIS discrepancy reports* (January to March 2010) MSC 6/ Circ 6.

[56] The Nautical Institute. *AIS forums.* Available at http://www.nautinst.org/ais/reportedProbs.htm

of AIS, LRIT also does not address ships below 300 GT and it is also vulnerable to hacking. Thus threats from small boats and hackers could continue to pose challenges to the LRIT system.

5.5.3 MDA and asymmetric threats

Sun Tzu (2005) in his famous Art of War underlined the need to be aware of one's enemies when he remarked:

Know thy self, know thy enemy. A thousand battles, a thousand victories.

MDA is the strategy of being aware because it is about being forewarned, which is as good as being forearmed. Asymmetric challenges in the maritime domain arising from multitudes of ships, luxury crafts and fishing vessels crisscrossing oceans are an onerous task. Law enforcement agencies cannot patrol all the vastness of oceans in pursuit of elusive forces of darkness. It is, therefore, tools like MDA which act as force multipliers helping in risk assessment and selective targeting and also ushering in a feeling of security through the knowledge of one's surroundings. Security, whether on land or offshore, comes with costs. However, considering the destruction and annihilation a terrorist bomb can cause, these costs have to be borne.

MDA is not all about surveillance alone since even though surveillance provides useful information, it is not possible, without firm intelligence to know which ship or craft could pose a significant threat. MV *Nisha*[57] and MV *Yinhe*[58] are cases in point

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[57] See MV *Nisha* incident on the high seas. Retrieved July 13, 2010 from World Wide Web http://www.specialboatservice.co.uk/raid-on-mv-nisha.php. The ship was boarded by U.K. SBS assault teams, acting on tip off that the ship may be carrying 'terrorist material' along with its stated cargo of sugar and based on inputs that the freighter's route from Mauritius was preceded by a stop at Djibouti, close to suspected Al-Qaeda havens of Somalia and Yemen. Post initial sweep of the vessel it was brought into port, where customs and anti-terrorism officers were able to perform an inch by inch search of the freighter. Nothing suspicious was found.

[58] Tyler, P.E (1993, September 06). No chemical arms aboard china ship. *New York Times*. Retrieved August 06, 2010 from the World Wide Web http://www.nytimes.com/1993/09/06/world/no-chemical-

wherein false information has led to undue interference. MDA is also not bereft of its share of problems. Apart from those arising from AIS and LRIT as brought out in this chapter, MDA faces the challenge of interoperability between law enforcement agencies and commercial setup, data interface from multiple sources and regulation of data transfer both nationally and internationally. The European SafeSeaNet, a domain awareness programme, faces challenges from illegal traffic. According to an EU surveillance report[59] 70% of black picture constitute illegal traffic in the European seas. Small boats which remain outside the purview of the MDA will continue to pose challenges as asymmetric threats unless they are brought under MDA. Nonetheless MDA is an initiative to reduce risks to maritime assets, a possible deterrence to perpetrators as they become aware that they are being watched and, more importantly, it takes away the surprise element from a possible asymmetric attack thereby giving law enforcement agencies time to react.

5.5.4 Maritime domain awareness and navigational freedoms

Maritime domain awareness is a beneficial tool in law enforcement as it provides a real time picture of a nation's surrounding waters. MDA's purport can also be misused by states to excessively restrict passage rights enjoyed by foreign vessels based on security threats. Different nations have differing security perceptions thus it is quite possible that some states may consider the use of sonar, ballast water

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arms-aboard-china-ship.html. *Yinhe* a Chinese freighter was suspected by U.S to carry chemical weapon materials however after boarding by joint U.S. and Saudi officials nothing was found. China demanded apology from the U.S. however U.S. did not tender the same on grounds that it had acted in good faith.

[59] Wise Pen Team (2010). Maritime Surveillance in support of common security and defense policy of European Union. Retrieved August 07, 2010 from the World Wide Web: www.eda.europa.eu/WebUtils/downloadfile.aspx?fileid=902. The report mentions occurrence of two types of pictures through AIS and radar in the MDA viz white and black. The white signifies validated plots and black signifies data not responding to electronic interrogation which may also include legitimate and illegitimate traffic.

exchange, the presence of ships near marine mammals, the mere transport of radioactive waste, transits by crude oil tankers, activities by naval oceanographic and survey ships as threats to their security and environment (Kraska, 2009). Thus, MDA could be used to deter or impede ships engaged in these activities which as per UNCLOS are lawful activities in the oceans. Some coastal nations have shown a willingness to misuse technical, legal, and policy advances in maritime governance such as marine spatial planning, as opportunities to enforce unilateral excessive maritime boundary claims and illegal claims of sovereignty or jurisdiction over the oceans, or impose unlawful restrictions on the rights and freedoms of navigation. The dangers posed by maritime domain awareness are particularly acute because it serves as a targeting mechanism for coastal states to assert their claims over foreign-flag vessels located offshore and, thus, upsets the careful balance between coastal state rights and the passage rights of foreign flag vessels (Kraska, 2009). Tracking systems like SJÖBASIS developed by the Swedish Coast Guard, which gets real time data from surface radars of Swedish Armed Forces, as well as AIS and vessel monitoring systems, has software inbuilt into the system which can highlight ships deviating from their planned track or slowing down for some activity (Swedish Coast Guard, 2010). This kind of surveillance which helps in zeroing in on suspicious activity, at the same time can also unduly interfere with ships innocent or transit passage.

5.6 Supply chain security initiatives[60]

Security incidents against international supply chains are threats to international trade and the economic growth of trading nations. International supply chains are highly dynamic and consist of many entities and business partners. The interplay of transport, logistics and supply chain has led to an era of multi level and multi layered security arrangements (Bichou, Bell & Evans, 2007). The dynamism of the elusive threat from the unknown has invented many security models of risk assessment, as the security incidents that take place are not accidental; they are intentional and

[60] The supply chain initiatives are discussed in Appendix 3.

perpetrated for maximum damage. Thus past events may be a poor guide for the future. They can only reinforce the statement that the threat to security is a clear and present danger (Bichou, Bell & Evans, 2007). The potential risk for containers and other conveyances of trade to be used as intercontinental delivery systems for weapons of mass destruction is real (Addario, 2007). With World projections for container cargo poised to surpass 200 million TEUs by mid 2011 (UNCTAD, 2009), the scanning of each container at every entry point is not only unfeasible but also uneconomical as it will result in delay and port congestion, severely affecting trade. Random X Ray scanning of containers does not provide satisfactory solution against the possible insertion of terror devices. Due to different elements (see Figure 13) involved in a supply chain, the vulnerability is based on the weakest link. The U.S initiated CSI and CT-PAT programmes with an aim to reduce the vulnerability in the supply chain. The World Customs Organisation also introduced SAFE programme for the same purpose.

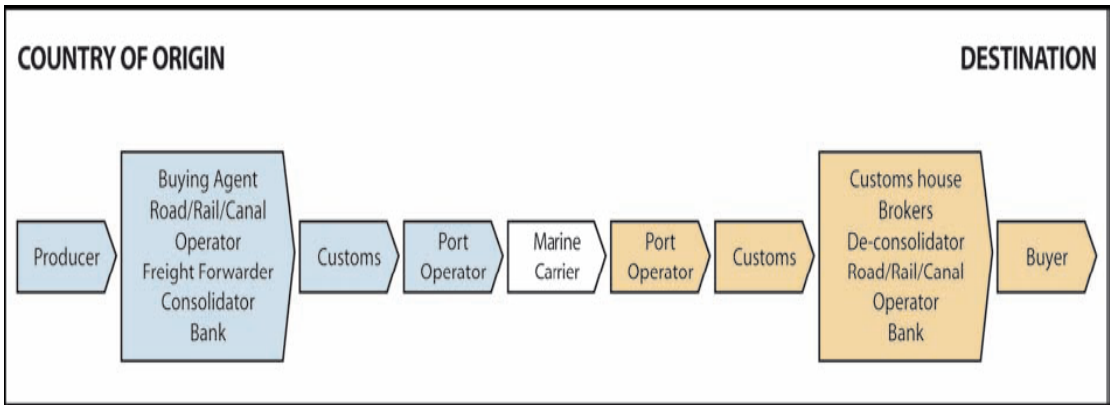

Figure 13 -Elements of supply chain.[61]

[61] Source: National Board of Trade (2008, January).*Supply chain security initiative: a trade facilitation perspective*. Retrieved July 08, 2010 from the World Wide Web http://www.kommers.se/upload/Analysarkiv/In%20English/Trade%20facilitation/Report%20Supply%20Chain%20Security%20Initiatives.pdf

5.6.1 Supply chain security and asymmetric threats

Threats to supply chain security are very dynamic and elusive due to the involvement of multiple elements in the chain sequence. Initiatives such as SAFE, ISO 28000, CT-PAT and CSI (see appendix 3), though based on the precautionary principle of control of cargo, can definitely reduce the vulnerability of the supply chain by improving the access control mechanism; improving container security and storage area access; and prohibiting tampering and smuggling of devices or explosives. Effective surveillance through X-ray screening, RFID technology, motion detectors and CCTV networks can provide effective deterrence against asymmetric attacks. Implementation of ISO standards can bring in uniformity in implementation of important international conventions all over the world and thus help in harmonising as well as integrating universal responses against asymmetric threats. Further, all attacks against maritime targets emanate from land be they piracy or terrorism. Hence, if security and surveillance on land are tightened, one can significantly lower the threat vulnerability of maritime assets offshore.

5.7 UN Security Council resolutions

In addition to the above maritime and supply chain security initiatives; states have been mandated to launch various other security related initiatives affecting the maritime domain by U.N. Security Council resolutions. Notable among those are the UNSCR 1540, 1874 and 1897.

5.7.1 UNSCR 1540[62] (WMD Proliferation)

UNSCR 1540 allocates three primary obligations to all states relating to such items:

1. to prohibit support to non-State actors seeking such items;
2. to adopt and enforce effective laws prohibiting the proliferation of such items to non-State actors, and prohibiting assisting or financing such proliferation;
3. and to take and enforce effective measures to control these items, in order to prevent their proliferation, as well as to control the provision of funds and services that contribute to proliferation. (UNSCR 1540, 2004)

5.7.2 UNSCR 1874(DPR Korea)[63]

This resolution, adopted on 12 June 2009, bans all arms transfers from the DPRK and transfer of all arms except small arms or light weapons to the DPRK. This ban also includes weapons of mass destruction (WMD) or missile-related technology. Resolution 1874 requires all states to inspect, in accordance with their national legal authorities and consistent with international law, all cargo to and from the DPRK in their territory, including seaports and airports, with the consent of the flag state, provided the coastal or port state has information that the cargo is prohibited by UNSC Resolutions. The resolution does not authorize the use of force if the inspection is refused. However, the requesting state is required to report the matter to the Security Council. If a suspect ship is on the high seas, U.N. member states are required to request the right to board and inspect. If refused, the resolution obligates

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[62] United Nations Security Council Resolution 1540 (2004) . The UN Security Council adopted UN Security Council Resolution 1540 in April 2004, thus establishing for the first time binding obligations on all UN member states under Chapter VII of the UN Charter to take and enforce effective measures against the proliferation of WMD, their means of delivery and related materials available at http://daccess-dds- ny.un.org/doc/UNDOC/ GEN/N04 /328 /43/PDF/N0432843.pdf ?OpenElement

[63]See information on United Nations Security Council Resolution. UNSCR 1874 (2009) available at World Wide Web http://daccess-dds-ny.un.org/doc/UNDOC /GEN/N09/368/ 49/PDF/ N0936849. pdf ? OpenElement

the flag state to direct its vessel to port for inspection. The resolution authorizes states to seize banned items and prohibits "bunkering services" such as refuelling or servicing of a ship with suspected cargo.

5.7.3 UNSCR 1897 (Somali piracy)[64]

Resolution 1897 (2009) adopted on 30 November 2009 requires all States, and in particular flag, port, and coastal states, states of the nationality of victims and perpetrators of piracy and armed robbery, and other states with relevant jurisdiction under international law and national legislation, to cooperate, in the fight against piracy, determining jurisdiction, and in the investigation and prosecution of persons responsible for acts of piracy and armed robbery off the coast of Somalia, consistent with applicable international law including international human rights law. It also requires all states, to ensure that all pirates handed over to judicial authorities are subject to a judicial process, and to render assistance by, among other actions, providing disposition and logistics assistance with respect to persons under their jurisdiction and control, such as victims and witnesses and persons detained as a result of operations conducted under UN Security Council resolution 1897.

5.7.4 Implications of UNSCR

These resolutions, in order to take effect, are required to be adopted into the state's domestic laws for effective implementation. Though obligations exist for states but, in absence of penalties or sanctions, such obligations may not be complied with especially by rogue states. The adoption and its implementation by states often stems from the legitimacy of the resolution (Boese, 2005). PSI has not been accepted as a norm creating initiative by all states and the interdiction principle promulgated by UNSCR1540 stems from it (Song, 2007). Some writers like Talmon

[64] See information on United Nations Security Council Resolution UNSCR 1897 (2009) available at http://daccess-dds-ny.un.org/doc/UNDOC/GEN/N09/624/65/PDF/N0962465.pdf?OpenElement

(2009) claim that UNSCR acting under chapter VII of U.N. charter has in fact replaced the conventional law making process at the international level. If this is true, then it is definitely a paradigm shift in the international law making process. According to Article 25 of U.N. Charter all member states are obligated to accept and carry out decisions of UN Security Council. However, in practice these resolutions can only work if they are binding and there are some penalties attached, failing which these resolutions remain just paper action.

5.8 Conclusion

Initiatives and surveillance mechanisms have their own fair share of legal and system generated drawbacks as pointed out in this chapter. Notwithstanding the same, the fact that these mechanisms are in place as precautionary and preventative measures to address maritime threats is in itself an effective deterrent to perpetrators. However, whether these are adequate or inadequate can be gauged, sad but true, only after an occurrence of an incident.

Chapter 6

Discussion and conclusion

6.1 Freedom of navigation

The freedom of navigation doctrine advocates the principle of non interference and exclusive flag state control across ocean spaces beyond the coastal state jurisdiction. Over the years, the concept of freedom of the seas and hence the freedom of navigation has faced a lot of challenges owing to the dictates of time and state practice. However, the concept continued to remain in vogue even though it underwent transformation both in the area of applicability and in the way it was applied. UNCLOS, which came years later, has also upheld this principle wherein the High Seas have been promulgated as open to all states for lawful use. The navigational freedoms enjoyed by foreign flag ships have also been protected in EEZ and Territorial Waters through the exercise of High Seas freedom and innocent passage respectively provided they are not detrimental to the sovereignty and

security of the concerned coastal states. That is to say, navigational freedoms cannot be practiced at the behest of risks to life and destruction of the property of other people or states.

UNCLOS rightly balances the coastal state interests and the flag state rights to ensure the freedom of navigation in every zone. By promulgating the need for domestic laws to be in consonance with the international law, UNCLOS goes a step further in its attempt to bring in uniformity in state practice so as to preserve the freedom of navigation in every maritime zone. UNCLOS, considered as the constitution of the ocean, is hugely silent on maritime terrorism and according to Efthimios Mitropoulos (2006), Secretary General of the IMO, the legal framework that regulates freedom of seas can only be effective if it is flexible enough to stand the dictates of time and face new challenges. UNCLOS (1982) derives this flexibility through addition of words "[m]atters not regulated ... [t]o be governed under rules and principles of general international law" to its preamble. This gives UNCLOS the dynamism to survive the test of time and take on new challenges. Post 9/11 asymmetric threats have become a lurking danger in the maritime domain. Countering them and balancing navigational freedoms will be a challenge that will be posed to UNCLOS in the event of a 9/11 type attack in the maritime domain.

6.2 Asymmetric threats and challenges

The growth of international trade and shipping fleets year on year brings increased threat vulnerabilities.[65] Asymmetric threats in the maritime domain, statistically, do not have the requisite numbers to signify a growing threat when compared to those in the terrestrial environment. However, to ignore the threat based on statistics would be foolhardy. The past decade has witnessed a growth in piracy as never before spreading its vicious tentacles as far as 1000 nm from shore. However, there has

[65]More ships means more inspection load on law enforcement agencies and the security infrastructure which can lead to the possibility of compromise or laxity or both somewhere down the line.

been no significant maritime terror attack since *Superferry 14*, this despite the fact that maritime targets especially containers are very vulnerable to sabotage and clandestine activities. The proliferation of knowledge of seamanship and ship handling cannot be downplayed as there are a few terror networks today that have potential maritime capability. The mutually beneficial link up of terror networks and insurgent groups with pirates, as is suspected in the case of Somalia, together with proliferation of WMD can be a formidable threat in the maritime domain in the days to come; if unchecked, it will have a deleterious effect on international shipping.

6.3 Hypothetical scenarios

In order to analyse the impacts of security initiatives on navigational freedoms as a result of state(s) reaction to terror attacks, it is essential to generate hypothetical scenarios and use war gaming methods. The aim of this asymmetric wargaming[66] is to discuss the behaviour of the affected state or states and international community with regard to navigational freedoms following an asymmetric terror attack, or in the event of availability of credible intelligence indicating the strong possibility of such an attack. Past reactions to security incidents by concerned states, also give valuable indications to their future actions. However, the response of a terror affected state or states to a particular terror incident apart from other factors will also largely depend on the scale and nature of the attack.

Let us look at some of the various maritime terror scenarios that could happen based on perpetrators' intent and capability. In the event of proliferation of the CBRN technology, the perpetrators could use a container vessel to act as a Trojan horse to carry a CBRN device located in one of the few thousand containers and detonate it in the vicinity of a major port like Los Angeles or Long Beach or Rotterdam.

[66] Wargaming is a visualisation process of action, response, and counter response of own force's course-of-action (COA) in relation to an enemy's course of action and response. Source :http://www.infantryglossary.com/W.htm

Perpetrators could also target Cruise vessels like the *Oasis of the Seas* (Oasis class[67] of cruise vessels) which is symbolic of luxury or elitism. The vessel which can carry about 6000 passengers would be a prime target. Perpetrators could ram the vessel at high seas using an explosive laden small boat or a subsurface craft launched from a mother vessel (logistic support vessel) to cause mass genocide. Encouraged by the huge publicity of the BP incident in the Gulf of Mexico, perpetrators could target offshore oil rigs either by hijacking a ship and using the ship as a missile or by ramming the platforms using suicide crafts or small boats to cause environmental disaster. Perpetrators could also deploy mines or even launch a missile attack against a ULCC or VLCC in the Suez Canal or Strait of Hormuz or other major oil choke points to cause severe disruption in oil trade and also cause environmental damage.

6.4 Asymmetric threats and creeping jurisdiction

The above mentioned incidents are likely to generate differing counter responses from various states based on the impact, enforcement capability and national or political will. Undoubtedly a WMD terror incident is likely to generate much more reaction and drastic measures than the offshore bombing of a VLCC or ULCC tanker as the causalities and mayhem from such an attack would be phenomenal.

[67]Oasis of the seas and Allure of the seas belong to Oasis class of cruise vessels.

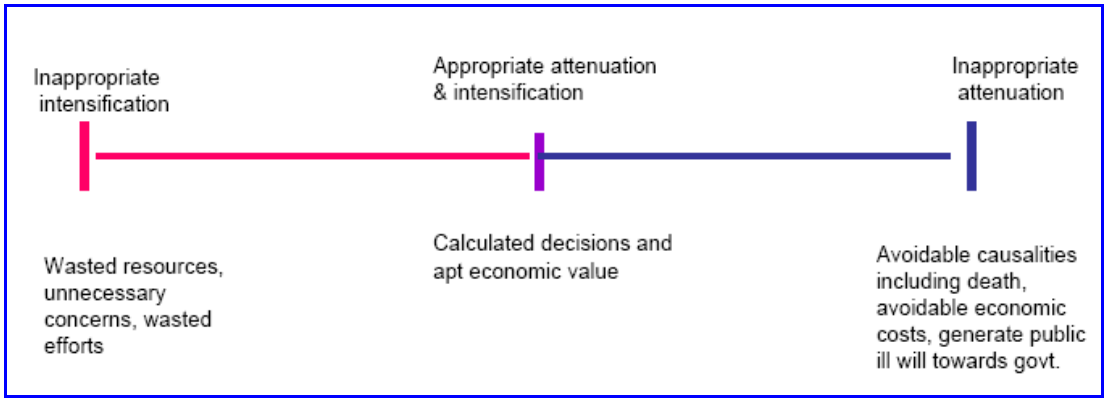

Figure 14-Spectrum of risk amplification.

The diagram in Figure 14 depicts policy decisions based on the intensity and attenuation of risk issues clearly suggesting the half way house as the optimum principle for ideal policy decisions. A study carried out by a Carnegie Mellon team[68] has revealed that people respond to terror attacks with anger and are more likely to support aggressive anti terror policies than mere precautionary ones (T.S. Thomas, 2002) and hence the risk amplification (Leiss, 2003)[69] of the impending threat may force states to take certain retaliatory measures which may even lead to a war like scenario. The international community may also respond with drastic measures to show solidarity with the affected state or states through IMO or Security Council Resolutions. These may be short term as well as long term measures to deter such attacks in the future. The following could be some of the possible ways to counter maritime threats:

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[68] See Carnegie Mellon Study reveals impact of fear, anger on American perception of terrorism available at World Wide Web http://www.cmu.edu/cmnews/ 020510/020510_terrorism.html

[69] The social amplification of risk framework is based on the metaphor of amplification: signals are received, interpreted, amplified, and passed on by different social actors. The media belong to the most important "stations" of amplification by selecting and framing risk messages and transmitting them to the public. The social amplification of risk framework (SARF) is not only considered the most comprehensive overall framework extant for the study of risk but also as a policy tool in the public domain arising out of risk issues. Media portrayal, public sensitivity and nature of hazard greatly influence societal response which in turn forces policy decisions.

6.4.1 IMO initiatives

A WMD incident in all likelihood could force many maritime states to re-visit the recently in force SUA Protocol of 2005 and adopt it in the same way as was done in the case of 1988 SUA Convention[70] following the 9/11 incident. This action in large measure would pave the way for international acceptance of interdiction principles of PSI. Attacks against cruise vessels and VLCCs by small boats would strengthen the case for making mandatory[71] the applicability of ISPS and LRIT to non SOLAS vessels including leisure craft and traditional fishing boats thus affecting the navigational freedom currently enjoyed by them. IMO could take additional steps to legislate non-consensual boarding of vessels in peacetime to interdict terrorists and WMD. In particular, it could focus on expanding the authority granted to ship masters under ISPS to permit them to consent to any search of their vessels for anti terrorists' measures (Hodgekinson et al, 2007). It may also not be surprising if IMO contemplates a PSI type maritime Convention to strengthen maritime security initiatives against WMD proliferation duly incorporating the PSI boarding clauses. Such a Convention would definitely tilt the balance against navigational freedoms.

6.4.2 Regional and bilateral initiatives

Any WMD attack on U.S. or EU states will add impetus to U.S. led CT-PAT and CSI programmes wherein it would be very likely that the concerned state would not allow vessels in its territory from states that are not party to CSI and CT-PAT type programmes (Argomaniz, 2010) or may even consider diverting these vessels to a secluded zone for closer inspection, which may result in undue delay. Bilaterally, the PSI programme of the U.S. will also get the much needed attention with the tendency of the U.S. to enter into boarding agreements with willing flag states.

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[70] IMO urged member nations to become parties to 1988 SUA Convention following the 9/11 and as a result about 142 states had become parties to the Convention by 2006.

[71] International Maritime Organisation (2006). *ISPS Code and non SOLAS vessels*.

Further, it is very much likely that following a WMD attack signifying a certain technology proliferation in the hands of terrorists, interdiction and boarding of ships suspected to be involved in WMD transfer at sea would be considered as legal and consistent with UNSCR 1540 and thus increased PSI related interdiction and boarding, even in contiguous zone of participating states, may eventually lead to its overall acceptance in international law.

6.4.3 Unilateral actions

Coastal states enforce maritime security laws based on their assumed threat perceptions and interpretation of actions required under international law. The immediate reaction of any state under attack from terror will be to impose security level 3 in accordance with the ISPS Code which may entail closure of port (s) to all commercial activities. Often, as a fallout of a terrorist incident, law enforcement efforts lead to increased boarding and inspections of ships on the pretext of self defence and establishment of security zones which ultimately leads to restrictions to navigational freedoms. Influential states [72] may also impose certain security preconditions like mandatory presence and round the clock patrolling by armed guards, security surcharge in ports and installation of additional advanced security devices for ships entering or transiting their territory which may restrict navigational freedoms of ships. Further, customary international law under the UN Charter allows self-defence measures, high seas interdiction and preventive and retaliatory actions when threat is imminent (Thomas, 2009). These actions can be initiated by any state invoking Article 51 of the UN Charter.

[72] Daly E (2002, November 27). After oil spill, Spain and France impose strict tanker inspections. New York Times, A5. Following *Prestige* incident France and Spain issued notifications which imposed at sea inspections clauses on single-hulled oil tankers more than 15 years old including banning unseaworthy ships passing through their EEZs.

Thus a state will be justified under *Caroline*[73] criteria (Crawford, 2002) to interdict a vessel destined for a port where it intends to release a deadly biochemical agent or has the intention to ram the port with explosives (Guilfoyle, 2007). Security concerns can force states to review international customary laws. A case in point being the *MV San* incident wherein a North Korean vessel *MV San* was boarded and searched for nuclear material by the Indian Coast Guard in August 2009 within Indian territorial waters under UN Security Council resolution 1874[74]. The action of the Indian maritime law enforcement agency was considered by the international community to be in consonance with the UNSCR though as per UNCLOS the ship did have the right of innocent passage. This departure from customary law due to a UN Security Council resolution clarifies that the customary practice of freedom of navigation can be sacrificed to ensure peace and security. Further, ICJ (1992) in the *Lockerbie* incident[75] has also upheld that obligations that arise from the Security Council Resolution take precedence over international treaties; hence, it goes without saying that UNSCR under Chapter VII is a binding obligation for all UN member states. Thus nations may look to UNSCR for authorising interdictions under Chapter VII to address the problems of non consenting states. These authorisations will bear impact on the free movement of ships throughout the ocean.

Further creeping of jurisdiction is another measure resorted to by states based on security concerns which have a direct impact on navigational freedoms. Suppose an oil platform is attacked; the concerned coastal state, as a preventive measure may depart from UNCLOS which authorises only a 500 m safety zone around offshore

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[73] *Caroline* criteria refers to incident that dates back to 1837 when British armed forces entered U.S. territory and destroyed a vessel owned by American citizen which was engaged in aiding insurgency in Canada and justified the action as self defence.

[74] Refer to para 5.7.2 for the resolution.

[75] International Court of Justice Reports (1992). Questions of Interpretation and Application of the 1971 Montreal Convention arising from the Aerial Incident at Lockerbie (Libya v. UK), Order of 14 April 1992.

installation and increase it to an extant based on its threat perceptions. India, for example is actively considering a no vessel zone up to 5 nm around offshore installations owing to the Mumbai attacks and persistent threats from LeT to blow up these installations (India's Government, 2009). These no vessel zones, when enforced, can significantly reduce the available navigable water area within the Indian EEZ thus impacting the passage rights enjoyed by foreign flag vessels within the zone.

6.4.4 Security, freedom of navigation and creeping jurisdiction

After having examined some of the various options and possibilities available to both the affected state(s) and international community based on hypothetical scenarios, let us look to draw conclusions through state practice by analysing some of the incidents that took place in the past wherein interdiction / boarding occurred without permission from flag states based on threat perceptions.

In 1871, *Mary Lowell* an American merchant vessel was captured off the Bahamas with a cargo of arms meant for Cuban rebels fighting a war against Spain. The U.S and Spain presented their case to a mixed commission and the U.S. case was rejected on the grounds that the U.S. had negligently allowed the ship to fall into wrong hands thus depriving it of its flag state rights. Spain's case was upheld as self-defence though the act occurred at high seas (Moore, as cited in Zwanenberg, 1961). In 1873 *Virginius* a U.S. merchant vessel was captured on the high seas by the Spanish Navy whilst engaged in the shipment of arms for Cuban insurgents. Spain defended its action as self- defence, a claim which was accepted by Britain but was rejected by the U.S (Moore, as cited in Zwanenberg, 1961).

In recent times also states have resorted to interdiction for maintenance of peace, security and self-defence. During the Cuban missile crisis, the U.S asserted its right to stop and search vessels bound for Cuba. America justified its action as regional peace keeping and the same was not contested by the Soviet Union (Dyke, 2005).

Also on 08 October 1997, the UNSC adopted a resolution authorising Economic Community of West African States to stop and inspect vessels entering Sierra Leone to enforce an embargo on importation of petroleum products and arms (Soons, 2001). Israeli defence forces seized an Iraqi[76] flagged ship in the Red Sea about 300 nm from Israel with about 50 tons of arms meant for Palestinians. Israel defended its action as self- defence and was largely supported by the U.S (Horowitz, 2002; Whittaker, 2002). Following the September 11 attacks, the U.S commenced its interdiction and boarding of vessels in the Indian Ocean, Red Sea and Strait of Hormuz in search of Osama Bin Laden (DIILS, 2003 as cited in Dyke 2005). It also issued notification to the maritime industry that ships suspected of carrying Osama or his staff would be forcefully boarded. The U.S justified its acts as those arising out of self-defence. Environmental security arising out of transport of ultra hazardous cargo has also forced states to act contrary to UNCLOS as was seen in the case of *Pacific Pintail* a British nuclear cargo vessel which was forced out of Chilean EEZ by Chilean Forces in 1995 citing safety issues. Thereafter, Chile modified its Law for nuclear safety to require prior authorisation for any transport of nuclear or radioactive substances through its EEZ, which is a classic example of creeping jurisdiction (DIILS, 2002 as cited in Dyke, 2002).

6.5 State practice, opinio juris and customary law

The interdiction cases above highlight the fact that states have used the right of self defence to deviate from customary law practice and exercise extra territorial jurisdiction. The right of self defence is mentioned in Article 51 of the UN Charter wherein under an exceptional circumstance a state can have the right of individual or collective self defence. Currently, the issue of whether these interdictions at high seas can be labelled as against principles of UNCLOS has some writers up in arms claiming that the UNCLOS principles are valid only for peaceful use of oceans

[76] Lloyd's list showed documents to the effect showing the legal owner as Iraqi however Israel claimed that the vessel was owned by Palestinians.

(Churchill & Lowe, 1999; Dalton, 1988). Thus, vessels with terrorist motives cannot claim navigational freedoms under UNCLOS. In a nut shell, one can adduce from the foregoing that coastal states have exercised greater control over oceans whenever there has been a threat to their safety and security and these measures undoubtedly are likely to continue in the future.

A highly publicized WMD attack could increase the acceptance of arrangements such as PSI as a feature of international law and lead to wider state practice of high seas interdiction including, possibly, of ships from non consenting states (through UNSCR authorisation). It is argued that the widespread practice of PSI could conceivably bring in a new rule of high seas interdiction based on state practice. This possibility cannot be ruled out since customary law, it is generally believed, finds its source from state practice and *opinio juris,* hence if enough states act (state practice) in a particular manner out of a sense of legal obligation(*opinion juris*) for a particular time then a new rule of customary law is created(Churchill & Lowe, 1999; Baker, 2010). ICJ judgement in the *North Sea Continental Shelf*[77] case (as cited in Churchill & Lowe, 1999) adjudicates this process of creation of customary law. The same was also evident in the emergence of Continental Shelf as a legal concept (Churchill & Lowe, 1999). Thus if the boarding agreements of PSI reach a significant number and, based on this, there is consistent practice of high seas interdiction, it may develop into customary law even before it is accepted through a Convention as was in the case of EEZ(Churchill & Lowe, 1999 p.161; ICJ Rep 13(as cited in Churchill & Lowe, 1999)).[78]

[77]ICJ in the *North Sea Continental Shelf* case *ICJ Rep.1* (1969) decided that only a widespread and representative participation in the Convention might suffice of itself to transform the purely conventional rule into a customary one. Thus a treaty provision if adopted by sufficient number of states, satisfying widespread and representative participation clause, can change the provision to a customary rule.

[78]*ICJ Rep.*13 *Libya /Malta Continental Shelf Case* (1985). The ICJ said that it is incontestable that …the EEZ…is shown by the practice of states to have become part of customary law even before the Convention had entered into force.

6.6 Concluding thoughts

The analysis of various asymmetric threats and their consequences indicates that a WMD attack would be catastrophic, and based on the societal risk amplification, especially from the developed world, the states may be forced to act tough which may of course include implementing the interdiction principles of PSI and possible enforcement of extra territorial jurisdiction based on threat perceptions. Maritime security initiatives and domain awareness tools are indeed force multipliers for law enforcement agencies to deal with asymmetric threats. However, at the same time, the possible misuse of some of the initiatives like boarding provisions in SUA Protocols of 2005 and PSI for furthering the coastal state practice of creeping jurisdiction over ocean spaces cannot be ignored. This can be gleaned from the fact that PSI accords contiguous zone (CZ) the same status as that of internal waters and territorial sea with regard to boarding rights, whereas, the UNCLOS considers CZ as part of the EEZ/high seas with respect to navigational rights. Thus in the event of PSI attaining a customary law status the coastal states may extend their territorial sea rights in CZ, which would impact the navigational freedom currently enjoyed by ships in these waters.

It is thus ironic to note that states that advocate of freedom of navigation are also pressing for PSI, which could strengthen the phenomenon of creeping jurisdiction practiced by some states. The need to curtail the practice of extra territorial jurisdiction has resulted in certain safeguards, like the consensual boarding clause, which undoubtedly can also be exploited by naughty states or non-state actors for their advantage through denial of permission to board. States may also face opposition from conservatives as WMD or terror related interdictions at high seas are not prescribed in UNCLOS and hence are considered as violations of freedom of navigation principles.

Technological advancement[79] can help reduce interdictions at sea but involves huge installation, operating and maintenance costs which may not be affordable to the economically poor states. Also complete reliance on technology will not be devoid of risks as no technology is completely tamperproof and terrorists do have capabilities to hack computers and networks and exploit them to their advantage.

Further, the growing numbers of bilateral boarding agreements, entered into between states which allow high seas interdiction to deter terrorists and WMD proliferation outside the purview of the UNCLOS, gives indications of a possible shift in ideology and emergence of new customary norms in the area of maritime security through state practice (Thomas, 2009). Writers like Stuart Kaye (2007) have argued for changes in the flag state regime based on the view that unless that regime is challenged, the development of international law will always be sectional and reactive.

Judge Jesus (2003) of ITLOS has remarked that:

> *One should not be so resistant to change certain aspects of legal regimes, if such change is of paramount importance to fight new forms of and approaches to criminal activity at sea that affect all states otherwise, we might all become victims but at the same time passive promoters of piratical and terrorist crime waves that may engulf the shipping activity in many areas of the world oceans.* (p.38)

To conclude, one can say that the flag state regime is a deeply valued traditional norm which is difficult to change. However, when in the face of threats as grave as WMD, it will not be difficult to conceive the development of a new customary right

[79] Employment of electronic scanning of ships through satellites, incorporation of smart chips into containers, biometric identification and RFID technology in all ports and onboard ships to prevent sabotage.

to interdict ships, outside the law of the sea based on state practice, and thus if the number of states asserting a right to deal with security measures continues to grow in the context of asymmetric threats, especially WMD related, then navigational freedoms may be challenged and may also begin to erode with creeping jurisdiction.

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Appendix 1

Asymmetric warfare- Definitions

1. **Definitions**

1.1 Asymmetric warfare is not something new to the history of warfare. The concept, as a technique, has been employed by armies since centuries and even dates back to the Greek era when the Greek army used Phalanx against enemy (Buffalo, 2006). The ancient Chinese strategist Sun Tzu's following maxim outlines the key strategy of an asymmetric attack giving essence to the fact that the theory is not a modern invention[80]

> *[Y]ou can be sure of succeeding in your attacks if you only attack places which are undefended. You can ensure the safety of your defence if you only hold positions that cannot be attacked*. (Sun Tzu, 2005)

1.2 There were many attempts by various writers to define asymmetric warfare. Political analyst T.V. Paul defines asymmetric warfare in his book titled "Asymmetric Conflicts: War Initiation by Weaker Powers," as

> *Conflict involving two states with unequal overall military and economic power resources*. (Paul, 1994, p.20)

1.3 This definition however was silent on threats from non state actors. The U.S specific publicized working definition defines asymmetric approaches

> *[a]re attempts to circumvent or undermine US strengths while exploiting US weaknesses using methods that differ significantly from the United States expected method of operations. [Asymmetric approaches] generally seek a*

[80] Sun Tzu. *The Art of War*(Translated by Lionel Giles) (El Paso, Texas: El Paso Norte Press,2005)

major psychological impact, such as shock or confusion that affects an opponent's initiative, freedom of action, or will. Asymmetric methods require an appreciation of opponent's vulnerabilities. Asymmetric approaches often employ innovative, non-traditional tactics, weapons, or technologies, and can be applied at all levels of warfare -- strategic, operational, and tactical -- and across the spectrum of military operations. (Steven Metz and Douglas V. Johnson II, 2001)[81]

1.4 Definition which is general in nature and quoted by many military journals is the one given below by Steven Metz[82] (2001).

In the realm of military affairs and national security, asymmetry is acting, organizing, and thinking differently than opponents in order to maximize one's own advantages, exploit an opponent's weaknesses, attain the initiative, or gain greater freedom of action. It can be political-strategic, military-strategic, operational, or a combination of these. It can entail different methods, technologies, values, organizations, time perspectives, or some combination of these. It can be short-term or long-term. It can be deliberate or by default. It can be discrete or pursued in conjunction with symmetric approaches. It can have both psychological and physical dimensions.

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[81] Steven Metz and Douglas V. Johnson II. *Asymmetry and U.S. Military Strategy: Definition, Background, and Strategic Concepts* (Carlisle, PA: Strategic Studies Institute, 2001), 5-6.

[82] Ibid.

Appendix 2

AIS and LRIT

2.1 Automatic Identification System (AIS)

IMO adopted a new regulation 19 and revised Chapter V of the Safety of life and property at sea (SOLAS 74 as amended) Convention to incorporate AIS. The Convention required all ships over 300 gross tonnages or that carried 12 or more passenger on international voyages, to install AIS. The system was initially adopted by IMO as a safety tool for collision avoidance however is now being investigated as a tool for maritime security (Cairns, 2005)[83].

2.1.1 Working and technicalities

AIS operate on VHF radio frequency and hence can detect other equipped targets in and around bends, behind hills and also in restricted visibility conditions thus giving a distinct advantage over radar. AIS exchanges data regarding navigational and voyage related information of ships with other AIS enabled ship and shore stations. The dynamic data is required to be transmitted at rates up to once every two seconds and static information is only transmitted once every six minutes. The signals are broadcast automatically and continuously without human intervention. AIS has two class systems. Class 'A' for SOLAS vessels and class 'B' for non SOLAS and leisure craft.

2.2 Long Range Identification and Tracking

The Maritime Safety Committee (MSC) at its 81st session in May 2006 adopted new regulations for the LRIT together with associated performance standards and

[83]William R. Cairns, "AIS and Long range identification and tracking." *The Journal of Navigation* 58 (2005):181-189.

functional requirements (IMO, 2006)[84]. The LRIT has been included in SOLAS chapter V on Safety of Navigation making it mandatory for ships 300 gross tonnage and upwards on international voyages viz: passenger ships, including high-speed craft; cargo ships and mobile offshore drilling units. The ships are required to transmit their identity, location and date and time of the position. The LRIT data is independent of AIS and there can be no connectivity between the two systems. LRIT differs from AIS on many issues apart from enhanced range, AIS is an open broadcast system which can be received by anyone using AIS receiver, however data derived through LRIT is available only to the recipients who are entitled to receive such information. The safeguards concerning the confidentiality of LRIT data have been built into the regulatory provisions. LRIT is thus a closed system. Following are entitled to LRIT data provided they are contracting parties to SOLAS:

1. Flag state at all times;
2. Port state in respect of a ship that is at sea, irrespective of where it is, that has indicated its intention to enter a port facility in that state or a place under the jurisdiction of that state;
3. Coastal state in respect of a ship at sea, other than within the territorial waters of its flag state that is within 1,000 nm of its coast (even if the ship does intend to enter a port in that state).

2.2.1 Mechanics of LRIT

LRIT is satellite based restricted information distribution system. LRIT is compatible with Inmarsat –C, Mini –C and D+ terminal. LRIT equipment transmits a very restricted range of information (ship's identity position, date and time of position) every six hours. This frequency of transmission can be increased based on security incident to every 15 minutes using Inmarsat SOLAS equipment or upto every 02 minutes with Inmarsat non SOLAS equipment. LRIT is a point to point signal and is

[84] International Maritime Organisation (IMO). "Long range identification and tracking (LRIT)" http://www.imo.org/safety/mainframe.asp?topic_id=905. (accessed July 15, 2010).

secure from all but state sponsored interception. The signals from ships are not encrypted but transmitted in random packets as per the standard Inmarsat protocol.

2.2.2 LRIT Data flow[85]

The LRIT system requires states to set up a National Data Centres that would release data to International Data Exchange (IDE) on a strictly regulated basis. Countries which move into a regional or cooperative arrangements based on cost saving techniques would have RDC (Regional Data Centre) or CDC (Cooperative Data Centre) (Murphy, 2009). The aim is for IDC to facilitate web based data flows among these centres. The data flow or the diagrammatic representation of LRIT architecture is shown in the figure.

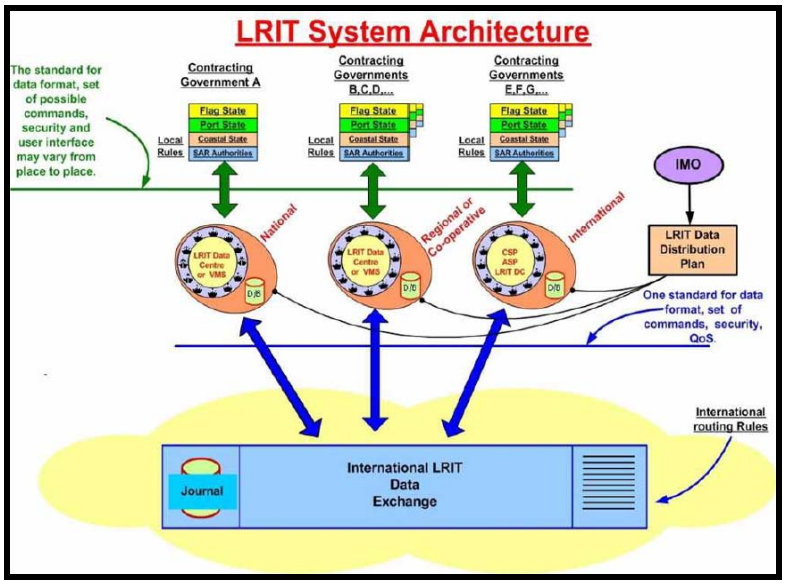

Fig A1. LRIT System Architecture[86].

[85] Martin N. Murphy, "Lifeline or pipedream? Origins, purposes and benefits of automatic identification system, long range identification and tracking and maritime domain awareness" in the *Lloyds MIU handbook of maritime security*, eds. R.H.Burns, S .Bateman and P. Lehr (Boca Raton: CRC Press, 2009), 13-28.

[86]International Maritime Organisation (IMO). " Long range identification and tracking (LRIT)" http://www.imo.org/safety/mainframe.asp?topic_id=905. (accessed July 15,2010).

The flag states have the choice to decide to which NDC, RDC, CDC or IDC their flagged ships are to report. The ships are then required to report through a Communication Service Provider (CSP) to an Application Service Provider which in turn forwards the processed data to the concerned data centre as requested by the flag administration of the ships concerned (Murphy, 2009).

Appendix 3

Supply chain security

3.1 Supply chain security initiative

A lot of supply chain security initiative programs came about after 9/11 for example BASC in South America, EU's Customs Security Programme and APEC Star of Asia Pacific. The main aim of the entire programme was to enhance security of supply chain at the same time reduce delays as a result of elaborate inspections. It is pertinent to mention that for ensuring continuance of freedom of navigation at sea, there is all the more need for elaborate security arrangements on land or port of departure which can ensure terror free and uninterrupted trade flows. In the following paragraphs a few of the International and U.S. initiatives on supply chain security initiatives are discussed to shed light on how these efforts reduce the vulnerability of the ports and ships from asymmetric threats.

3.1.1 World Customs Organisation Standards to Secure and Facilitate Global trade (SAFE)[87]

The WCO's SAFE framework is one of the most ambitious initiatives for security in the supply chain, since it includes all member states in the WCO and is based on cooperation both between different customs authorities and between companies and customs authorities. The framework applies to all modes of transport. SAFE is intended to establish standards that create security in the supply chain in order to create confidence, predictability and enhance prospects of identifying high risk

[87] Swedish National Board of Trade, *Supply chain security initiative: a trade facilitation perspective.* 2008, January, http://www.kommers.se/upload/Analysarkiv/In%20English /Trade%20facilitation/ Report %20Supply%20Chain%20Security%20Initiatives.pdf.

consignments. SAFE is based on four core elements which are intended to permeate the work of improving security in the supply chain:

1. **Advance electronic information:** SAFE has been formulated in such a way that it harmonises the elements of data required in electronic advance information on imports, exports and transit shipments.
2. **Risk management:** each country participating in SAFE undertakes to introduce a consistent risk management approach that addresses threats to security.
3. **Outbound inspection:** in line with the importing country's request and based on a comparable risk targeting method, the exporting country shall perform an outbound inspection of high risk containers and cargo, preferably with equipment that does not require the cargo to be physically opened, for example large-scale X-ray machines and radiation detectors.
4 **Business partnerships:** SAFE defines benefits that customs authorities shall offer businesses that meet minimal supply chain security as well as standards and best practices.

Thus SAFE ultimately simplifies international trade, secures supply chain and at the same time combats terrorism also.

3.1.2 ISO 28000[88]

This is an international standard specification for enhanced security management system for global supply chain. The principles of this standard is to facilitate better controls of flow of transport, to combat smuggling, to meet threats of piracy and terrorism and thereby create a secure management of the international supply chain. IMO Maritime Safety Committee discussed the applicability of ISO 28000 in its 86th session and acknowledged it by according following comments:

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[88] International Standard Organisation, *ISO 28000 Specification for security management system for supply chain*. September 15, 2007 http://isotc.iso.org/livelink/livelink/fetch/- ISO_28000_2007 %28E%29.pdf.

[t]he ISO 28000 series were now published and numerous ports, terminals and organizations were being certified by third party independent accredited certification bodies; while recognizing that ISO standards could be applied to all ships, irrespective of size, type, purpose and whether operated internationally, domestically or within internal waters.…..

This International Standard[89] is based on the methodology known as Plan-Do-Check-Act (PDCA). PDCA can be described as follows.

Plan: establish the objectives and processes necessary to deliver results in accordance with the organization's security policy.

Do: implement the processes.

Check: monitor and measure processes against security policy, objectives, targets, legal and other requirements, and report results.

Act: take actions to continually improve performance of the security management system.

ISO 28000 thus in a nut shell articulates a strategy for assessment of risk and determining countermeasures as a core component of providing physical security for the set up.

3.1.3 Container Security Initiative (CSI)

This is U.S. customs initiative brought about after the September 11 attacks. The initiative aims to increase the security of the containers, which are considered as Trojan horses, being shipped to U.S. from around the World. CSI[90] uses a security regime to ensure all containers that pose a potential risk for terrorism are identified

[89]International Standard Organisation, supra note ibid.

[90] U.S. Customs and Border Protection, *Fact Sheet*. October 2 2007, http://www.cbp.gov/ link handler /cgov/trade/cargo security/ csi/csi_fact_sheet.doc.

and inspected at foreign ports before they are placed on vessels destined for the United Sates. The key core elements[91] of CSI are as follows (Roach, 2003):

1. **Identify high-risk containers.** U.S. Customs and Border Protection uses automated targeting tools to identify containers that pose a potential risk for terrorism, based on advance information and strategic intelligence.
2. **Pre-screen and evaluate containers before they are shipped**. Containers are screened as early in the supply chain as possible, generally at the port of departure. RFID tags are used for identification. Use technologies to pre-screen high-risk containers to ensure that screening can be done rapidly without slowing down the movement of trade. This technology includes large-scale X-ray and gamma ray machines and radiation detection devices.
3. **Using smarter and tamper proof containers**. Electronic sealing, motion or light detectors to enable tamper proof containers.

In all more than 58 CSI ports are in operation throughout the world (U.S. Customs and Border Protection, 2007).CSI participating ports have a distinct advantage in port business. The waiting time for movement of goods is fairly reduced due to reduced inspection in respect of goods loaded from CSI participating ports. So it is safe to conclude that CSI initiative can significantly improve a port's business and also lower the vulnerability of container shipping from asymmetric attacks.

3.1.3 **CT-PAT**

CT-PAT[92] is a U.S. Customs and Border Protection programme launched as a voluntary government-business initiative to build cooperative relationships that

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[91] Capt. Ashley Roach, "Container and port security: a bilateral perspective". *The International Journal of Marine and Coastal Law*, 18, (2003):341-361.

[92] U.S. Customs and Border Protection. *CT-PAT overview*. December 13, 2007 http://www . cbp .gov / xp / cgov/trade/ cargo_security/ctpat/ what_ctpat /ctpat_overview.xml. (accessed 10 July ,2010)

strengthen and improve overall international supply chain and U.S. border security. C-TPAT recognizes that U.S. Customs and Border Protection (CBP) can provide the highest level of cargo security only through close cooperation with the ultimate owners of the international supply chain such as importers, carriers, consolidators, licensed customs brokers, and manufacturers. Through this initiative, businesses are required to ensure the integrity of their security practices, communicate and verify the security guidelines of their business partners within the supply chain. By joining CTPAT, members are ensured of reduced CBP inspections resulting in reduced border delay times. CTPAT programme also incorporates assignment of a C-TPAT Supply Chain Security Specialist (SCSS) to the company to validate and enhance security throughout the company's international supply chain. Importers are required to conduct a comprehensive assessment of their international supply chains based upon the established C-TPAT security criteria. An importer[93] who outsources or contracts elements of his supply chain, such as a foreign facility, conveyance, domestic warehouse, or other elements, he must work with these business partners to ensure that pertinent security measures are in place and adhered to throughout their supply chain. CT-PAT thus aims to comprehensively secure the supply chain.

[93] World Trade Press. *What is CTPAT*. http://www.world trade ref.com/WTR: _site/C-TPAT_ main. asp . (accessed July 10,2010).