GROWING SHIPPING TRAFFIC IN THE STRAIT OF MALACCA: SOME REFLECTIONS ON THE ENVIRONMENTAL IMPACT 1

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Abstract

This paper discusses the potentially adverse impact that rising traffic would have on the Strait of Malacca. It assesses the capacity and readiness of the littoral states of the Strait to counter pollution in the waterway and the contribution of the international community to the cause. It evaluates the proposal by the littoral states to undertake projects aimed at maintaining navigation safety in the Strait and protecting its environment. It is hoped that the discussion therein will provide some food for thought to policymakers, shipping industry players, enforcement agencies and other relevant stakeholders on the importance of maintaining the Strait and on the need to put in place the necessary measures to protect its environment.

Keywords: Strait of Malacca, shipping traffic, navigation safety, sea line of communication, environmental impact

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1. The importance of the Strait of Malacca

The Strait of Malacca is one of the world’s most strategic and important shipping lanes. It is a vital artery linking the region’s economy with the rest of the world. Located in one of the world’s most vibrant economic growth areas, the Strait is a pivotal link in international trade and transportation. Carrying half of its oil supplies and a third of world trade, the issue of maritime trade and energy transportation in the Strait is rightfully a matter of international concern.

The Strait is a sealane of immense strategic, political and economic importance not only to the littoral states - namely Malaysia, Indonesia and Singapore - but also to the international community. Such keen attention can be seen in the manner regional economic powerhouses such as China, Japan and Korea view security in the Strait, through which much of their trade and energy imports are transported, from a strategic standpoint. These countries depend on the Strait to carry much of its international trade and much of its energy imports that largely come from the Middle East. Given such dependency, it is little wonder that these trade and energy-dependent countries have an increasingly huge interest and stake in keeping the Strait secure and safe.

Underlining the tension of geo-political rivalry and multiple interests in the Strait, China is concerned that the US may adapt a “China containment” policy that seeks to deny it of crucial energy supplies through controlling access in the chokepoints in the Strait. In the event of hostility breaking out between the two, it is foreseen that the Strait will become the theater for their power projection and maneuvering to neutralize each other through naval means. Many other naval powers count the Strait as a vital sealane in their strategic calculation.

All these highlight the prominence of the Strait of Malacca as one of the world’s most crucial and strategic energy transportation routes. Geopolitical and economic developments have put the Strait into the spotlight as a sea line of communication (SLOC) of immense global importance. Hence, its features as an energy transportation channel and the dynamics involved in the Strait warrant close observation as a prelude to drawing up appropriate responses in managing the challenges it faces.

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2 The concept of sea line of communication (SLOC) accords the world’s strategic waterways such as the Strait of Malacca and the Strait of Hormuz the status of ‘maritime highways’ facilitating vast trade flows critical to global economic prosperity. Such passages are exposed to various elements that threaten their security and access. These elements include military concerns involving threats emanating from the conflicts between nations and from sea mines, and non-military ones including natural disasters, navigation-related accidents, pollution, piracy, terrorism and “creeping jurisdiction” of regional states.
2. Shipping traffic in the Strait of Malacca

Traffic in the Strait has been growing steadily over the last decade, in line with growing international trade which is carried for the most part using seaborne transport (see Table 1). In 2006, over 65,000 ships3 sailed through the Strait of Malacca, making it one of the world’s busiest sealanes. This figure is expected to grow in the coming years, in light of the increase in global trade and the rise of East Asian economies, and the accompanying upsurge in the demand for shipping services to transport the majority of their trade. This projection will most definitely exert a bigger financial demand to the littoral states - namely Malaysia, Indonesia and Singapore - to ensure navigational safety of the burgeoning traffic in the Strait and to protect it from marine pollution. Since the September 11 incident, the heightened perception of risk to ships traversing the Strait has further added to this burden. Many expensive initiatives have been introduced by the littoral states to improve security in the crucial waterway.

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of vessels</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000</td>
<td>55,957</td>
</tr>
<tr>
<td>2001</td>
<td>59,314</td>
</tr>
<tr>
<td>2002</td>
<td>60,034</td>
</tr>
<tr>
<td>2003</td>
<td>62,334</td>
</tr>
<tr>
<td>2004</td>
<td>63,636</td>
</tr>
<tr>
<td>2005</td>
<td>62,621</td>
</tr>
<tr>
<td>2006</td>
<td>65,649</td>
</tr>
</tbody>
</table>

Source: Marine Department of Malaysia

Given the situation, the littoral states are rightfully concerned about the high costs they have to bear to maintain initiatives already in place, upgrade them and introduce new ones in due course, towards meeting the expectation of safety passage by the international users of the Strait. Already, huge amounts of money and other resources have been spent by the littoral states to facilitate smooth and safe traffic in the Strait.4 Considering that an most of the vessels traversing it are merely on transit and do not stop at ports along the Strait, the littoral states are not being unreasonable in feeling aggrieved by the expenses they have to bear to maintain the sealane. The expectation of safe passage by the

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3 This figure was based on the number of ships reporting to the Strait of Malacca’s Ship Reporting System (STRAITREP), is a mandatory reporting system under which the statistics of ships traversing between the Vessel Traffic System (VTS) centers established in Port Klang and Tanjung Piai along the Malaysian coast bordering the Strait are captured.

4 An official of Aegis, a London-based security and intelligence agency, estimated in 2006 that the littoral states had invested over US$1 billion to procure equipment and put in place and train manpower to improve security in the Strait.
international users of the Strait gets higher, but their use of the waterway does not bring much economic benefit to the littoral states. To the chagrin of the littoral Strait, the international users have not extended much assistance in helping out with the resources needed to ensure safe passage in the Strait.

There have been various studies attempting to collate statistics from various perspectives to capture the traffic volume in the Strait of Malacca (see Table 2). They provide valuable sources of reference to understand the importance of the Strait as a maritime chokepoint and the various issues and challenges it faces as a heavily used sealane.

**Table 2**
Major studies on the Strait of Malacca

<table>
<thead>
<tr>
<th>Year</th>
<th>Study</th>
<th>Author</th>
<th>Remarks</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>Navigational Safety in the Strait of Malacca</td>
<td>Kamaruzaman, R.M.</td>
<td>This paper assesses the volume of shipping traffic and navigational safety in the Strait of Malacca.</td>
</tr>
<tr>
<td>1996</td>
<td>Chokepoints: Maritime Economic Concerns in Southeast Asia</td>
<td>Noer, J. H.</td>
<td>This study addresses economics and trade flows, current and potential problem of sea lines of communication (SLOCs) in Southeast Asia and emphasises the need for the United States to control shipping and regulate navigation through the chokepoints of Southeast Asia.</td>
</tr>
<tr>
<td>1997</td>
<td>The Strait of Malacca in the Malaysian Economy</td>
<td>Naidu, G.</td>
<td>This paper proposes to establish more explicitly the importance of the Strait of Malacca particularly as a transport thoroughfare for Malaysian economy.</td>
</tr>
<tr>
<td>1999</td>
<td>The Impact of Transportation on Wildlife in the Malacca Strait</td>
<td>US Trade Environment Database research</td>
<td>This study focuses on quantifying shipping traffic contributing to congestion at confined channels of the Strait of Malacca.</td>
</tr>
<tr>
<td>2001</td>
<td>Seaborne Trade Flow in the Asia Pacific: Present and Future Trends</td>
<td>Baldwin, C.</td>
<td>This study focuses on crude oil transportation in the Strait of Malacca.</td>
</tr>
</tbody>
</table>
Several of the studies outlined in Table 2 concentrated on the navigational safety aspect of shipping in the Strait. One such study focused on capturing the number of ships or shipping movements contributing to congestion at confined channels of the Strait (US Trade Environment Database, 1999). Another study attempted to gauge the total number of ships calling at the ports along the Strait by defining their passage as passing by such confined channels, namely around One Fathom Bank Lighthouse off Port Dickson, Philip Channel, and Middle Channel off Horsburgh Lighthouse (Kamarulzaman, R.M., 1996). Japan conducted studies in 2000 and 2001 on traffic in the Strait for the Maritime Safety System Development Plan for Indonesia.

Several studies highlighted the critical role of the Strait in facilitating global energy transportation, including looking at shipping traffic in the Strait from an economic perspective (Naidu, 1997; Noer, 1996). An often-cited research on the subject focused only on the traffic of oil in the Strait, estimating that 9.5 million barrels of oil passed through the sealane in 1997 and projecting that the capacity will grow to 20 million barrels in 2020 (Baldwin, 2001). A recent forecast by Nippon Foundation suggested that annual traffic in the Strait would increase to well above 140,000 vessels by 2020, a staggering number which would bring with it the attendant increase in the traffic of oil tankers and energy carriers.5

Despite the collation of data and the studies conducted, obtaining accurate shipping statistics in the Strait presents a challenging task due to the fact that through traffic in the waterway need not report at any calling stations along it. Although there are reporting systems such as the Vessel Traffic Information Service (VTS)6 in use in the Strait, reporting is done on a voluntary basis and limited to certain calling points. The task of quantifying traffic density is made harder as ships do not follow specific routes except at portions of the Strait under the coverage of the various navigation systems in the sealane such as the Automatic Identification System (AIS) and the Traffic Separation Scheme (TSS). This is compounded by the unrecorded cross-traffic of barter ships between Peninsular Malaysia and Sumatra, and the presence of unknown numbers of small fishing vessels and traditional small crafts. Adding to the statistical discrepancy is the fact that not all ships using the Strait call at the ports of the littoral states. Even in the case of ships calling at these ports, not all of them use the whole stretch of the Strait, hence may go unrecorded.

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5 Estimate made by Mr Yohei Sasakawa, Chairman of Nippon Foundation, during his speech at the ‘Symposium on the Enhancement of Safety of Navigation and the Environmental Protection of the Strait of Malacca and Singapore’ (Kuala Lumpur: 13-14 March 2007).
6 VTS provides active monitoring and navigational advice for vessels in particularly confined and busy waterways. There are two main types of VTS, surveillance-based and non-surveillance based. Surveillance-based VTS consists of one or more land-based sensors such as radars, Automatic Identification System (AIS) and closed circuit television sites, which output their signals to a central location where operators monitor and manage vessel traffic movement. Non-surveillance based VTS consists of one or more reporting points at which ships are required to report their identity, course, speed, and other data to the monitoring authority.
3. Challenges facing the Strait of Malacca as a crucial sealane

As a vital shipping lane, the Strait of Malacca faces a compendium of threats which go beyond ‘traditional’ security concerns such as those involving piracy and the smuggling of illegals and contraband goods. In the post 9/11 security matrix, the potential threat of terrorism, no matter how remote, has been added to a long list of threats facing the Strait. Together, they combine to pose concerns for the littoral states and to all with any amount of stake and interest in the Strait.

The nature of maritime transport as an indispensable and almost irreplaceable enabler of the global economic system makes the question of safety navigation in key salenaes such as the Strait of Malacca an issue of tremendous strategic importance. Increasing focus has therefore been given on securing the maritime supply chain, from the point of production to consumption.\(^7\) The chain is linked by various transport modes and nodes in a long network of interactive, interdependent components and systems that bring products and commodities from the producers to markets and consumers. The extensive nature of the system of global maritime transport is such that any major security breach at any point of the maritime supply chain can halt its flow and even have potentially disastrous consequence to the global economy.

Key to this chain is merchant shipping which carries a majority of the world’s trade. After the September 11 attacks, some analysts have suggested that merchant ships may be vulnerable to assaults by terrorists hell-bent on creating the ‘nautical version of 9/11’, given the potential physical and psychological damage that they could inflict via such means. The attack on French-owned supertanker MV Limburg in the Arabian Sea in 2002 demonstrated that merchant ships are fair game as a terrorist target.\(^8\)

At the centre of global attention on securing international trade transportation is the Strait of Malacca, a pivotal waterway facilitating global trade, which faces various dramatic, shifting forces. Developments in global trade, economy, transportation, security and geopolitics, among many others, have had significant effects on the flow of trade transportation through the Strait. The boom in East Asian economies, especially in China, has seen tremendous growth in the volume of cargo and ships traversing through the Strait to facilitate their trade with the world. The telling impacts of these developments would necessitate the littoral states and other stakeholders of the Strait to adapt and change with them. The new world order and fresh paradigms call for the management the Strait to fit into today’s realities, and to cope with the increasing traffic volume and the multiple interests at stake in the Strait.

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\(^7\) The maritime supply chain involves a complex link of activities, systems, equipment, processes, information, players and many other components. It begins from the manufacturers of goods and producers of raw materials and commodities all the way to the consumers. This long chain encompasses valuable assets, equipment and machineries such as ports, ocean-going vessels, cranes, prime movers, godowns, warehouses and many other components deemed as potentially ‘lucrative targets’ for saboteurs.

\(^8\) Tanker blast : Experts cry ‘Osama!’ . Asia Times. 9 November 2002.
Among the major challenges faced by the stakeholders in managing Strait are:

i) **Increasing traffic volume**

The tremendous explosion in foreign trade has led to increasing traffic volume in the Strait and thus congestion along it. The littoral states must meet the demands of such a situation head-on and address issues arising from the capacity strains caused by increasing traffic in the Strait. As such, it is crucial for them to come up with sound policies and develop effective solutions in managing traffic in a waterway of such importance. As the Strait continues to grow in terms of strategic importance, the world will be keenly expecting the littoral states to continuously improve the management of the waterway which is so vital to the economic prosperity of the region and to international trade.

It is expected that traffic volume of ships carrying energy resources in the Strait will increase in the years ahead, as demand for energy in the region grows, mainly fuelled with the astounding rise of China as an economic superpower. The ever-increasing traffic in the Strait adds to the challenge in navigating this waterway which features a width of only one kilometer at its narrowest point. Its challenging navigational features, coupled with the huge traffic volume, making the Strait vulnerable to threats of ships colliding and grounding. With growing traffic in the Strait, there is a corresponding rise in the expectation by the international community for the littoral states to ensure navigation safety to the Strait’s users.

ii) **Rising threat of pollution**

Arising from the increasing risk of ships accidents as a result of rising traffic in the Strait, the threat of ship-based pollution looms large. Over the years, several incidents have occurred in the Strait involving ships releasing oil and hazardous and noxious substance (HNS) into the waters (see Table 3). The vulnerability of the Strait’s environment, along with the need to protect it, has long been recognized by the international community. The presence of so many small crafts presents a hazard to larger vessels, although vessels do take precautions to avoid colliding with them (Lamri and Saidi, 2006). Navigation in the Strait is made more complex with the presence of moving sandbars, wrecks and rock outcrops, and the narrow deep water channels that present a challenge to navigate larger vessels. These combine to provide a challenging course for ships traversing the Strait and heighten the risk of pollution occurring in the busy sealane. In addition, there are threats coming from land-based sources such as factories and resorts which can also pose a considerable degree of threat to its ecosystem.

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9 In this respect, the work of the Tripartite Technical Experts Group (TTEG), formed in 1975 and consisting of officials from the three littoral states, has been instrumental in enhancing navigational safety in the Strait.
Table 3
Major pollution incidences in the Strait of Malacca and Singapore

<table>
<thead>
<tr>
<th>Year</th>
<th>Vessel name</th>
<th>Type of oil and HNS</th>
<th>Spillage (barrels of oil)</th>
<th>Location and cause</th>
</tr>
</thead>
<tbody>
<tr>
<td>1975</td>
<td>Showa Maru</td>
<td>Crude</td>
<td>54,000</td>
<td>Strait of Singapore Grounding</td>
</tr>
<tr>
<td>1992</td>
<td>Nagasaki Spirit</td>
<td>Crude</td>
<td>100,000</td>
<td>Strait of Malacca Collision</td>
</tr>
<tr>
<td></td>
<td>Ocean Blessing</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1997</td>
<td>Evoikos Orapin Global</td>
<td>Crude</td>
<td>175,000</td>
<td>Strait of Singapore Collision</td>
</tr>
<tr>
<td>1999</td>
<td>Sun Vista</td>
<td>Fuel oil</td>
<td>14,000</td>
<td>Strait of Malacca Sinking</td>
</tr>
<tr>
<td>2000</td>
<td>Natuna Sea</td>
<td>Crude</td>
<td>49,000</td>
<td>Strait of Singapore Grounding</td>
</tr>
<tr>
<td>2001</td>
<td>Indah Lestari</td>
<td>Phenol</td>
<td>89</td>
<td>Johor Strait Sinking</td>
</tr>
</tbody>
</table>

Source: Department of Environment, Malaysia

Malaysia has put in place plans and equipment to combat oil spills in its waters. It has oil spill control stockpile in the Strait of Malacca which has been mobilized on a number of occasions to combat oil spills. Malaysia is party to international conventions intended to minimize and prevent oil pollution from shipping, namely the International Convention on Oil Pollution Preparedness, Response and Co-operation, 1990 (Annex I, II and V) and the Convention on the International Regulations for Preventing Collisions at Sea, 1972. At the national level, there is an oil spill response program based on the National Oil Spill Contingency Plan, under the operation of the Department of Environment with the Marine Department functioning as the on-site commander. The plan, which has been in existence since 1976, divides the national response into three tiers which require the mobilization of ‘local’ or ‘on-site’ oil spill plan and equipment; the national oil spill plan and equipment; and the regional oil spill plan and equipment. Taken together, these national and international measures play significant roles in protecting the nation’s maritime environment.

However, the increase in tanker traffic in the Strait does pose additional potential pressure on available resources. Protecting the marine environment from vessel-based pollution is closely linked to navigational safety, which in turn is related to traffic volume. Malaysia therefore faces a huge challenge to mitigate the risk of pollution in the management of the Strait in the years to come, in correspondence with the projected increase in traffic in the waterway.
iii) **Rising cost of management and maintenance**

The international users consider the Strait as an international sealane which they have the right to use, as provided for in Part III of the United Nations Convention on the Law of the Sea (UNCLOS) 1982 on transit passage of strait used for international navigation. Nevertheless, the efforts and costs of maintaining and securing the waterway have always been undertaken by the littoral states. The high expectations from international users and the ever-burgeoning traffic in the Strait exert considerable demand on the littoral states to provide the maritime infrastructure to ensure security and navigation safety in the waterway. This is taxing to the littoral states which include developing nations with limited resources and more pressing priorities to address.

Despite the fact that many new initiatives have been introduced to improve safety of navigation, security and environmental protection in the Strait, it is regrettable to note that the international users, save Japan which provides assistance in to enhance navigation safety via funding from Nippon Foundation through the Malacca Strait Council, have thus far not matched their usage of the Strait with contribution to the costs of maintaining and securing it. Japan has been providing a significant amount of funding and resources to install and maintain navigational aid in the Strait, as well as pollution preventive measures.

While many systems and equipment have been put in place to improve navigation safety in the Strait, the rising traffic volume in the waterway demands more resources to be spent and bigger investment made. This will exert tremendous financial burden to the littoral states in the years to come. Taking into account that most of the ships merely transit the Strait without calling at the ports along it, the expenditure they have to bear is grossly disproportionate to the economic returns they gain from the shipping traffic in the sealane.

The need for burden sharing to maintain the Strait was reiterated by the littoral states at the IMO Meeting in Jakarta on 7-8 September 2005. They took the discussion further during the KL Meeting 18-20 September 2006 to expedite the matter in a more resolute manner. This underlines their growing concern with the rising costs they face, and brings into focus their underlying frustration that the international community has not matched their heavy usage of the waterway with assistance to help lessen their financial burden.

Strong voices were heard during the KL Meeting to that effect. A senior delegate from Singapore stressed the need for the littoral states and the stakeholders to go beyond the confidence-building stage to concrete collaboration by realizing modalities for cooperation between them. He reiterated that the widening range of stakeholders and the raising of confidence and comfort level between them have created a conducive environment to the development of cooperation. All around, the littoral states agreed to foster, enhance and extend cooperation and operational arrangements with a view to further strengthen capacity building.
among them to ensure safety to ships traversing the Strait, with the concurrence of
delegates from various nations and stakeholders.

**iv) Rising perception of security threat**

The 9/11 attacks has spurred the maritime sector to reassess its vulnerabilities against potential acts of hostility and sabotage. The aftershocks of death and destruction caused by those attacks have forced the sector to focus on mitigating the security risks in its operations, systems and procedures. Nowhere is the issue of maritime security given sharper focus than in the strategic waters of the Strait of Malacca. In the wake of the incident, this crucial passage has been suffering from bad PR and been deemed a high-risk area due to its ‘image’ of being a piracy-prone area and the perceived threat of terrorism in its waters. Of the major concerns in the Strait, ensuring the safe passage for vessels traversing it is the most pivotal. Already saddled with the threat of piracy, which has long been a bane for users along the waterway, the scourge of potential terrorism has added an extra burden to the littoral states in maintaining security in the waterway.

The intense concentration in energy transportation in the Strait has prompted several security analysts to speak of the probability of terrorist attacks on oil and gas-bearing ships in the Strait. In addition to such rumor-mongering, there is a tendency among some quarters to link piracy and terrorism, which has fanned negative media coverage on the actual security situation in the sealane, despite the fact that no concrete nexus has been proven to exist between the two. Such fear-mongering based on questionable opinions and analysis led to the categorization of the Strait as a “war risk zone” by the influential underwriters body, Lloyds Market Association (LMA) of London, in June 2005. Maritime underwriters swiftly took advantage of the declaration to raise insurance premium on ships passing through the Strait.

The International Maritime Bureau (IMB)\(^\text{10}\) reported that attacks (actual and attempted) attributed to pirates in the Strait of Malacca fell from 38 in 2004 to 11 in 2006.\(^\text{11}\) Most of these were merely “maritime muggings” by attackers in small boats with fast outboard motors on small low draft and fishing vessels.\(^\text{12}\) This sharp decline in piratical attacks underlines the much improved security situation in the waterway.

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\(^{10}\) IMB is a Kuala Lumpur-based organization dedicated to the prevention of trade finance, maritime, transport and trade fraud and malpractice. It acts as a focal point for the international trading and shipping industry and those associated with facilitating the movement of goods. IMB also manages the International Chamber of Commerce (ICC) Piracy Reporting Center dedicated to the suppression of piracy and armed robbery against ships.

\(^{11}\) IMB attributed the reduction in the number of attacks largely on the increased patrols in the Strait of Malacca by the navies of the littoral states.

However, despite the sharp reduction in piratical attacks in recent years and zero incident of terrorist attack on ships sailing through the Strait thus far, the world continues to have the impression that this prime passage is unsafe for vessels. Such negative perception needs to be put straight in the context of the marked decline in piracy incidents and the unrelenting efforts of the littoral states to maintain security in the Strait.

It is crucial at this juncture to separate piracy\footnote{Article 101 of the UN Convention on the Law of the Sea (UNCLOS) 1982 defines ‘piracy’ as consisting of any of the following acts: (a) any illegal acts of violence or detention, or any act of depredation, committed for private ends by the crew or the passengers of a private ship or a private aircraft, and directed: (i) on the high seas, against another ship or aircraft, or against persons or property on board such ship or aircraft; (ii) against a ship, aircraft, persons or property in a place outside the jurisdiction of any State; (b) 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; (c) any act of inciting or of intentionally facilitating an act described in subparagraph (a) or (b).} from terrorism.\footnote{Defining ‘terrorism’ is a task that is evoking very strong emotions in international relations. The term carries different meaning to different people. The US Central Intelligence Agency (CIA) defines it to mean “premeditated, politically motivated violence perpetrated against noncombatant targets by sub-national groups or clandestine agents, usually intended to influence an audience”. The United Nations’ General Assembly was considering a draft Comprehensive Convention on International Terrorism which would include a definition of terrorism, if adopted.} From literature review of the two subjects, it can be surmised that pirates commit their deeds for monetary gains, while terrorists are just out to score political points and make ideological statements and take revenge on what they perceive as injustices perpetrated upon them. Although there are perceived links between piracy and terrorism, especially after the 9/11 incident, they are distinctly separate from one another. Thus far, a definitive association between the two has yet to be established, although security analysts have spoken of the possibility of terrorists ‘subcontracting’ their dirty deeds to pirates. Anxiety over this continues to be based on mere opinions inclined towards worst-case scenarios and questionable threat perception rather than solid intelligence.

Despite the negative publicity given to the security situation in the Strait due to piratical attacks and heightened threat perception post-September 11, there is only a 1 in 2,000 risk of attacks occurring in the area.\footnote{On the basis of 38 attacks in the Strait in 2005 as reported by IMB against 62,621 ships traversing the Strait in the same year as reported by the Malaysian Marine Department.} Given the very low number of other incidents such as collision and pollution in the Strait, vis à vis the tremendous volume of traffic, the measures taken and infrastructure put in place by the littoral states can be lauded as effective. But needless to say, the measures have come at very high costs to procure, initiate, maintain and sustain.
4. Measures by littoral states to enhance navigation safety in the Strait and to protect its environment

The littoral states of the Strait have undertaken various initiatives aimed at maintaining and enhancing security in the waterway. They include:

- The formation of the Malaysian Maritime Enforcement Agency, a Coast Guard-type outfit providing sea-going maritime constabulary services looking after the safety of vessels transiting Malaysian waters.

- The implementation of MALSINDO, a coordinated patrol scheme involving the navies of Malaysia, Singapore and Indonesia. The trilateral initiative, launched in July 2004, is a joint special task force to safeguard the Strait and provide effective policing along the waterway. MALSINDO has bolstered joint naval patrols by the littoral navies in the Strait in a more coordinated and structured manner.

- The ‘Eyes in the Sky’ initiative, a maritime-cum-air surveillance operation over the Strait of Malacca and Singapore to detect and deter acts of piracy and transnational criminal activities in the Strait. It features combined maritime air patrol by the Air Forces and maritime enforcement agencies of the littoral states. The implementation of this groundbreaking initiative underlines the seriousness of the littoral states to combat piracy and trans-national criminal activities in the Strait and reflects the genuine commitment of the three nations in forging regional maritime security cooperation.

- The proposed Long Range Identification and Tracking (LRIT) of ships initiative by the Maritime Security Committee of International Maritime Organization (IMO). LRIT enables ships to identify each other's registration and the type of cargo being carried, hence contributes to enhance security in the busy sealane.

- The increase in maritime security initiatives at the bilateral level, such as joint patrols and naval exercises between the navies of the littoral states.

- The increased patrols by the Marine Police of the littoral states in the Strait which have resulted in the foiling of attacks on ships, the arrests of pirates and armed gang robberies and even the prosecution of the perpetrators.

In addition, several regional initiatives have been established in the South East Asian region to boost security. These include agreement on information exchange and establishment of communication procedures, treaty of mutual assistance in criminal matters and regional forum framework on measures against terrorism, counter-terrorism and transnational crime. An agency named South East Asian Regional Center for Counter-Terrorism has been set up, while agreements have been reached between ASEAN members and the grouping’s dialogue partners such as the US and EU with reference to cooperation against terrorism and in the field of security.
The drop in piracy incidents in the waterway in recent years speaks volumes of the effectiveness of the measures introduced by the littoral states to reduce security risk in the Strait. By all accounts, the measures implemented stand as proof of the dedication and commitment of the littoral states to secure the sealane from the menace of piracy and to allay the fears of the possibility of terror attacks occurring in its waters.

During the IMO meeting held in Kuala Lumpur in September 2006, the littoral states of the Straits of Malacca and Singapore proposed six projects aimed at maintaining navigation safety in the Strait of Malacca and protecting its environment, two crucial aspects in maintaining security in a SLOC like the Strait. The introduction of these projects underscores the acknowledgment of the littoral states of the need to address maritime security in a comprehensive manner by including other types of threats beyond physical attacks on maritime interests. The six projects are:

i. Removal of wrecks in the Traffic Separation Scheme (TSS) in the Strait of Malacca and Singapore.
ii. Cooperation and capacity building on Hazardous and Noxious Substance (HNS) preparedness and response.
iii. Demonstration Project of Class B automatic identification system (AIS) transponder on small ships.
iv. Setting up of a tide, current and wind measurement system to enhance navigational safety and marine environment protection.
v. Replacement and maintenance of aids to navigation in the Strait of Malacca and Singapore.
vi. Replacement of aids to navigation damaged by the tsunami incident in the Strait of Malacca and Singapore.

The issue of enhancing security in the waterway was given sharp focus during the Kuala Lumpur Meeting, in line with its theme ‘Enhancing Safety, Security and Environmental Protection’. It was encouraging to see delegates mulling over existing and evolving mechanisms of cooperation, and exploring modalities for future collaboration among the stakeholders towards enhancing security in the Strait. Key to providing security in the Strait is the sharing of the financial burden and resources required to initiate various security-related projects. The meeting marked a milestone in the discourse of burden sharing in the Strait as the matter was expedited in a resolute manner that befit the urgency of the matter at hand. During the meeting, there was no concealing the growing concern of the littoral states about the rising costs they face to protect shipping in the Strait. The meeting also brought into focus the underlying frustration of the littoral states towards the lackadaisical attitude of the international community towards helping to maintain secure passage in the Strait. There exists a yawning gap between their heavy usage of the waterway and their commitment in assisting the littoral states help lessen the financial burden of the littoral states in maintaining comprehensive security in the sealane.
In subsequent meetings on the Strait following the Kuala Lumpur Meeting in September 2006, including the Strait of Malacca Symposium in Kuala Lumpur in March 2007, the need for the littoral states and the stakeholders to advance beyond the confidence-building stage towards realizing modalities for cooperation between them was strongly highlighted. The littoral states have since made impressive advances to cooperate in matters concerning the Strait and have tirelessly called for the international community to close ranks with them to foster, enhance and extend cooperation and operational arrangements to maintain comprehensive security in the waterway. These are done with a view to further strengthen capacity building among them to ensure the safety and security of ships traversing the sealane for the benefit of the littoral states and the Strait’s users.

In a meeting convened by the IMO in Singapore in September 2007, the littoral states of the Strait made further inroads in the discourse of burden sharing in the passageway by agreeing on a cooperative mechanism to enhance safety, security and environmental protection in the sealane. The mechanism is a new framework conceptualized to protect safety and security in the Malacca and Singapore Straits. The landmark mechanism was the fruit of labor of previous IMO Meetings in Jakarta in 2005 and Kuala Lumpur in 2006 in which the building blocks to achieve international consensus on how best to share the burden of maintaining the two Straits were laid.

The cooperative mechanism is envisioned to provide a platform for the littoral states to engage in regular dialogues with the user states and other users of the Strait of Malacca to maintain safety and security in the waterway. It also offers the international community with a workable structure to engage in cooperative actions with the littoral states in various initiatives to meet this challenging objective. The establishment of the mechanism is a giant leap forward for the management of the Strait as envisaged in Article 43 of UNCLOS that advocates cooperation amongst the users of the Strait and the littoral states in efforts to maintain navigational safety and environmental protection in the sealane. Such a platform will enable the stakeholders of the Strait to exchange views, undertake joint projects and make voluntary monetary contributions to efforts to maintain the waterway. These are meant be achieved via three components in the mechanism, namely a forum for regular dialogue, a committee to coordinate and manage specific projects, and a fund to receive and manage financial contributions.

The way the mechanism is designed provides much ground to feel optimistic about its potential to be a successful platform instead of just being another mechanism for cooperation that starts with much fanfare but falters along the way. Participation in the mechanism is intended to be open to all stakeholders of the Strait and initiatives carried out on its platform are meant to be done in a voluntary manner. Such features will ensure that the shipping industry and shippers – often the fiercest critics of any suggestions of compulsory contribution by users towards efforts to maintain the Strait – contribute to the maintenance of safety and security in the Strait without much hesitation and opposition. It is hoped that the expression of their support during the Singapore meeting in September 2007 towards the proposed projects aimed at enhancing safety and security in the Strait will be followed up with meaningful, sustained actions.
It is heartening to note the endorsement and widespread support of major user states of the Strait such as the US, China, Japan, Korea and Australia towards the recommended projects. Even more encouraging is the expression of commitment by the governments of those user states to provide financial assistance to the projects. In fact, some of the projects are already underway; for example, China has been active in pursuing the initiative to replace navigation aids damaged by the 2004 tsunami, and the US has conducted a survey to assess the needs on the response to incidents involving HNS.

The September 2007 meeting in Singapore was also updated on the progress made in the implementation of the Marine Electronic Highway (MEH) Demonstration Project for the Straits of Malacca and Singapore. The MEH was jointly developed by the littoral states and the IMO to provide a marine information system to enhance maritime services and improve navigation safety and the management of coastal and marine areas in the Strait. The project was funded by the Global Environment Facility through the World Bank and additional financial support from Korea. The meeting also noted several other initiatives to enhance security in the Strait such as the establishment and operationalization of the Information Sharing Center of the Regional Cooperation Agreement on Combating Piracy and Armed Robbery Against Ships (ReCAAP).

It is hoped that the agreement reached to make the cooperative mechanism work will act as a breakthrough in international efforts to maintain the Strait and will inspire other initiatives towards enhancing security and safety in the sealane and towards protecting its environment. As mentioned by the IMO Secretary-General, Efthimios Mitropoulos at the of the Singapore meeting, the launching of the mechanism should not be considered as the end of the road but rather should be viewed as an opportunity to maintain and strengthen the communication channel among the Strait’s stakeholders and to facilitate a meaningful dialogue for the accomplishments for all the objectives set. The fact that the littoral states have demonstrated an admirable degree of flexibility and tolerance towards reaching consensus on a cooperative mechanism should be lauded. Their willingness to set aside differences and sovereignty issues to work together towards common goals could well provide a solid platform for further cooperation to maintain security in the Strait.

5. Environmental impact of growing traffic in the Straits

The rapid increase of vessel traffic in the Strait of Malacca has raised many important questions including its impact on marine ecosystem and biological resources. This narrow strait is already hosting over 65,000 vessels annually for international navigation and perhaps another 10,000 to 15,000 fishing vessels and small ships crossing between Sumatra and Peninsula Malaysia, and traffic is expected to increase further. As such, the risks of accidents and groundings and thus the specter of pollution in the Strait from sea-based such as oil and grease, HNS, solid waste, trybutile tin in anti-fouling paints and invasion of alien species through ballast water discharge are exceptionally high.
According to GESAMP (1990),

16 sea-based pollution arises from two main sources, namely accidental and operational sources, and the risks of pollution arising from both sources can be found in the Strait which hosts huge volume of traffic and a host of economic activities in its waters and along its coast.

Compared to the other seas littoral to Malaysia, the Strait of Malacca accounts for 47% of 165 cases reported in Strait of Malacca, South China Sea, Sulu and Sulawesi Sea and Straits of Johor (see Table 4). The potential magnitude of oil pollution in the Strait looms large due to the high number of vessels operating through the Strait. According to Marine Department of Malaysia statistics, 473,510 vessels were recorded passing through the Strait between 1999 and 2006, charting a phenomenal increase of 33% over the eight-year period.

Although many new technologies and regulations are in place to overcome the problem of operational discharge, some ships still discharge their tanks, offload their toxic sludge and even solid waste in the relative calm waters of the Strait or its approaches to save costs of discharging them at the next port. The effects of operational discharge on a busy and narrow sealane like the Strait can be considerable depending on the size of vessel.

Table 4
Oil pollution incidents in Malaysian waters

<table>
<thead>
<tr>
<th>Location</th>
<th>Year 1999</th>
<th>Year 2000</th>
<th>Year 2001</th>
<th>Year 2002</th>
<th>Year 2003</th>
<th>Year 2004</th>
<th>Year 2005</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Straits of Malacca</td>
<td>22</td>
<td>22</td>
<td>13</td>
<td>8</td>
<td>2</td>
<td>5</td>
<td>6</td>
<td>78</td>
</tr>
<tr>
<td>South China Sea</td>
<td>22</td>
<td>8</td>
<td>5</td>
<td>8</td>
<td>5</td>
<td>8</td>
<td>7</td>
<td>63</td>
</tr>
<tr>
<td>Straits of Johor</td>
<td>4</td>
<td>1</td>
<td>0</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>19</td>
</tr>
<tr>
<td>Sulu &amp; Sulawesi Sea</td>
<td>0</td>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td>Total</td>
<td>48</td>
<td>33</td>
<td>19</td>
<td>23</td>
<td>15</td>
<td>17</td>
<td></td>
<td>165</td>
</tr>
</tbody>
</table>

Source: Department of Environment Malaysia

Besides oil pollution from ship accidents, operational discharge also contributes to pollution from oil-based sources in the Strait. Tank cleaning, discharge of ballast water, antifouling toxin and dry docking are among some of the input from operational discharges of vessels (Lewey & Wybrow, 2004)

Table 5 shows the types of accidents involving ships occurring in Malaysian waters between 1990 and 2005. Casualties involving the sinking of ships make up the biggest number of incidents annually.

<table>
<thead>
<tr>
<th>Year</th>
<th>Collision</th>
<th>Sunk</th>
<th>Aground</th>
<th>Fire</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1997</td>
<td>13</td>
<td>20</td>
<td>4</td>
<td>4</td>
<td>41</td>
</tr>
<tr>
<td>1998</td>
<td>11</td>
<td>15</td>
<td>2</td>
<td>2</td>
<td>30</td>
</tr>
<tr>
<td>1999</td>
<td>11</td>
<td>29</td>
<td>2</td>
<td>6</td>
<td>48</td>
</tr>
<tr>
<td>2000</td>
<td>5</td>
<td>35</td>
<td>7</td>
<td>6</td>
<td>53</td>
</tr>
<tr>
<td>2001</td>
<td>15</td>
<td>39</td>
<td>5</td>
<td>6</td>
<td>65</td>
</tr>
<tr>
<td>2002</td>
<td>11</td>
<td>26</td>
<td>7</td>
<td>10</td>
<td>56</td>
</tr>
<tr>
<td>2003</td>
<td>16</td>
<td>21</td>
<td>4</td>
<td>1</td>
<td>42</td>
</tr>
<tr>
<td>2004</td>
<td>5</td>
<td>3</td>
<td>1</td>
<td>2</td>
<td>11</td>
</tr>
<tr>
<td>2005</td>
<td>8</td>
<td>7</td>
<td>2</td>
<td>3</td>
<td>20</td>
</tr>
<tr>
<td>2006</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2007*</td>
<td>5</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>117</td>
<td>243</td>
<td>41</td>
<td>52</td>
<td>456</td>
</tr>
</tbody>
</table>

Note: *until May 2007

Source: Marine Department of Malaysia

Anti-fouling paint is used on ships to control or prevent attachments of unwanted organisms. According to a study conducted in 2001 as cited by Ainul Raihan Ahmad (2005)\(^ {18}\), there was a very high level of butylin contamination in the areas around Port Dickson and Port Klang, and this level have increased drastically since 1996. The presence of butylin in the Strait poses a serious threat to food fishes and shellfish. Although the use of non toxic chemicals in anti-fouling paints has been mandated by IMO for use on all ships, Malaysia lacks enforcement to control such anti-fouling toxin in its waters.

Other detrimental impacts of increased ship traffic include coastal erosion and degradation of the coastal zone habitats. According to Basiron and Tan (2007)\(^ {19}\), mangrove erosion in Tanjung Piai on the Malaysian side of the Strait is mainly caused by drastic increase of ships calling at the Tanjung Pelepas Port. Data obtained from Department of Irrigation and Drainage Malaysia shows high trend of critical and


significant erosion especially in the Malaysian states of Perak, Selangor and Negeri Sembilan. The combined impact of increasing shipping movement and coastal development has exposed the coastal area of the Strait to erosion threats.

**Figure 2**

Erosion categories along the coastal area of Strait of Malacca

![Erosion Categories Graph](image)

*Source: Department of Irrigation & Drainage Malaysia*

The importation of alien organism in ballast water has also been shown to displace endemic species of marine fauna and flora in the Strait. Spores, eggs and the juveniles of alien species present in ballast water is discharged into the new environment. In the absence of natural predators and diseases, these organisms proliferate, often causing the extinction of endemic species as experienced with the infestation of zebra mussels in Australia. Presently, there are no regulations in Malaysia to monitor and control alien species from ballast water discharge, and this situation does not augur well with protecting the environment of a crucial waterway like the Strait.

The Strait’s environment faces threats arising from increasing number of vessel traffic include degradation to the coastal mangrove, coral reef and seagrass along and in the sealane. Mangrove swamps, which are low energy level areas which are likely to trap oil, along the Strait are especially vulnerable. When the air roots of these mangrove trees are clogged with oil, the oxygen level will fall, causing mortality to the plants. Coral reefs in the southern part of the Strait have all been lost but for some left in the waters off the beach resort of Port Dickson, while the large seagrass bed off Sungai Pulai in Johor is
also under threat of degradation due to the large number of ships plying the areas and the attendant increase in oil pollution.

6. The potential economic effects from pollution in the Strait

The potential threat of pollution originating from increasing shipping traffic in the Strait and the risks that it poses to the environment should not be underestimated. Chronic and environmental impacts will result in long term commercial damage to economic activities in and along the Strait especially to the fisheries and tourism industries.

Mariculture industries in the Strait are very sensitive towards all kinds of pollution. Fish and shellfish bred in mariculture cages or floating pens are particularly vulnerable to damage from oil pollution as they are trapped in those cages and pens. In addition, fish eggs and larvae are most sensitive towards oil, grease and HNS while sub-lethal levels of these will cause abnormalities to their development and even result in early death. It is indeed a cause for worry that cases of tumors and fin erosion in fish in areas chronically polluted by oil in the Strait have been reported.

Tourism activities, of which over 30% are marine tourism related, are presently the second most important foreign exchange earner for Malaysia. The tourism industry is highly sensitive to any form of pollution, especially marine tourism which depends on clean and pristine marine environment as the presence of pollutants such as tar balls on beaches will drive tourist away. A major oil spill incident the size of the Exxon Valdez incident would surely cover a huge part of the Strait and would cause irreparable damage to the ecosystem, fishery, biodiversity and the tourism industry. This would certainly be catastrophic to Malaysia’s tourism industry as all the resorts along the Strait of Malacca from Tanjung Piai to Langkawi are dependent on the natural beauty and resources in the Strait as their most important tourist attraction.

7. Towards protecting the Strait’s environment from rising traffic volume

Clearly, the risk of pollution caused by the increased shipping traffic in the Strait is very high and will continue to increase with the rapidly increasing traffic. A study by Japan International Transport Institute (JITI) in 2006 forecast that through traffic in the Strait will increase to 110,000 ship by 2010 and to 141,000 ships by 2020. These figures do not include cross strait traffic from Malaysia to Indonesia and vice versa and fishing vessels in the Strait’s waters. The increase in the volume of traffic in the Strait will bring along a concomitant increase in the risk of collision in the waterway and thus the threat of pollution.

While the tireless efforts of the littoral states and IMO to improve the safety of navigation have shown positive results, the increase in shipping traffic poses a grave threat to the safety of navigation in the Strait. The impact to the environment arising from accidents and pollution would be devastating to the littoral states. As such, measures put in place
by the littoral states and IMO to improve navigation safety such as the Marine Electronic Highway, STRAITREP and the aids to navigation fund need to be bolstered further as they are crucial to the protection of the Strait’s environment.

What is clearly needed is a comprehensive plan to monitor the seemingly rapid increase of vessels using the Strait. A management plan based on the internationally accepted Precautionary Principle is needed for the Strait to ensure that it can function as an important SLOC and continues to serve the shipping community and world trade. Such a plan will also contribute to the maintenance of biodiversity of this important marine mega-diversity region. The management plan could include among others:

- Determination of a carrying capacity of the Strait and a comprehensive risk analysis of the shipping traffic through the Strait.
- A protocol on the enforcement of environmental and international laws to ensure compliance and protection of the Strait’s environment.
- A maximum limit on the amount of oil or HNS allowed to be carried by vessels traversing the Strait to reduce the risk of pollution in cases of collision or grounding.
- More concerted efforts and funding made available for environmental protection projects and also for the rehabilitation of degraded ecosystems in the Strait.
- Cooperation between direct users of the Strait besides user states towards enhancing the safety of navigation and environmental protection of the Strait.
- Setting up of a regional authority (ala Joint Development Area management) made up of the littoral states to monitor, manage, protect, enhance and ensure sustainable development in the Strait and the protection of its environment.

Given the multiplicity of challenges faced by the Strait, the stakeholders must no longer procrastinate and be sidetracked by the fancies of people and nations who are only concerned with their own interest with little regard for the rights of the littoral states and the various risks posed onto the Strait due to growing shipping traffic in the waterway. Ignoring the environmental impact of intensive use of the Strait may come at a high price. If concrete actions are not taken now to protect its environment from the various threats it faces, future generations may be denied of the riches and benefits of the Strait of Malacca and may inherit a sealane degraded by pollution and environmental damage. Our inaction and failure to plan to protect the Strait’s environment may mean that we plan to fail.

MARITIME INSTITUTE OF MALAYSIA
14 November 2007