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PROTECTING THE MARINE ENVIRONMENT OF VITAL MARITIME PASSAGEWAYS

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Abstract

The Straits of Malacca and Singapore are two of the busiest maritime chokepoints in the world. Located between the oil producers of the Middle East and the major oil consumers of the Far East, these Straits came second only to the Hormuz Strait in terms of the volume of global oil transportation. As straits used for international navigation categorised under Article 37 of the Law of the Sea Convention 1982 (LOSC), littoral States of Malaysia, Indonesia and Singapore possess no rights to deny the exercise of the transit passage regime by foreign vessels plying these Straits. As a result, the marine environment of the Straits of Malacca and Singapore is gradually affected particularly by operational discharges from vessels. This paper looks at the possibility of designating the Straits of Malacca and Singapore as a 'Special Area' under the International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978 (MARPOL 73/78) in enhancing the protecting of the marine environment of these important waterways from heavy shipping activities. The viability of such a designation is examined by looking at the ecological and oceanographic character of the Straits as well as the preparedness of the littoral States in fulfilling the requirements of such a designation. This paper concludes by recommending the most appropriate 'Special Area' designation under any of the Annexes of MARPOL 73/78 for the Straits of Malacca and Singapore.

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Keywords: International maritime law, Malacca, marine environment, Singapore.



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1. Introduction

From the time when the doctrine of the freedom of the seas was championed until the concept of ‘closed seas’ was introduced, the law of the sea continued to develop to become a complex legal regime, evolving together with the advancement of human civilisations and maritime technology. The law of the sea today represents the mixture of both *mare clausum* and *mare liberum* doctrines intertwined together harmoniously (Gavouneli, 2007). The United Nations Convention on the Law of the Sea (LOSC) has always been regarded as a significant milestone of accomplishment in which the global community came together to create a set of rules governing the oceans that would be applicable to all.

As far as navigational rights through straits used for international navigation are concerned, LOSC has prescribed four types of passage rights namely the right of non-suspendable innocent passage, transit passage, and freedom of navigation as applicable in the exclusive economic zone (EEZ) or the high seas, all of which are codified in the LOSC. The one that applies most frequently to straits used for international navigation is the transit passage regime expounded in Article 37 of the LOSC.

Transit passage regime confers liberal rights of navigation and overflight to all vessels and aircrafts exercising passage through or over straits used for international navigation (Rusli, 2012b). In other words, passage of vessels through international chokepoints such as Strait of Gibraltar, Bab-el-Mandeb, Hormuz Strait, the Torres Strait and the Straits of Malacca and Singapore cannot be impeded, hampered or impaired by any of the States bordering the straits. With increasing maritime traffic in straits forming crucial international sea lines of communication all around the globe, the question of whether or not the navigational right of transit passage regime justifiably balances the environmental interests of States bordering straits and maritime powers is open to question. Consequently, as far as the Straits of Malacca and Singapore are concerned, Malaysia, Singapore and Indonesia have to come up with a solution to minimise vessel-source pollution, particularly from operational discharges.

Since the introduction of the LOSC, international law on the protection of the marine environment has developed enormously through various conventions and treaties. This development can be categorised into four levels (Chircop, 2009), each representing different types of degree of environmental protection under international law. Level 1 consists of general obligations for States to protect the marine environment from vessel-source pollution, as found in the LOSC and other international conventions. Level 2 provides a higher degree of protection including specific measures such as vessel source discharge restrictions under the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 (MARPOL 73/78). Level 3 involves an even more specific type of protection through IMO guidelines such as those concerning the designation of ‘Particularly Sensitive Sea Areas’ (PSSA) and its entailing associate protective measures. Level 4 concerns an extraordinary situation where coastal States in particular regions, motivated by serious concerns over the environment and due to imminent danger of marine pollution, are empowered to intervene in relation to shipping casualties. The 1969 maritime tragedy of Torrey Canyon was a clear example on this point. The Liberian-flagged Torrey Canyon was a supertanker capable of carrying a cargo of 120, 000 tonnes of crude oil, was navigating near the waters off the English Channel when it struck Pollard’s Rock on Seven Stones reef between Cornwall on mainland Britain and the Scilly Isles off the western tip of Cornish Peninsula on 18 March 1967. The vessel spilled 119, 000 tonnes of oil into the sea, contaminating 80km

of French coast and 120 km of Cornish Coast on the British mainland. Due to the huge impact of this incident which could pose imminent danger to the coastal States of Britain and France, both States worked together to contain the oil slicks from spreading to other areas within that region that may endanger the marine environment and the well-being of the coastal population. Examples could also be drawn from incidents that have taken place in the Straits of Malacca and Singapore. The Eoikos and Orapin Global collision in 1997 has spilled 29, 000 tonnes of crude oil into the Strait of Singapore which then flowed into the Malaysian side of the Strait of Malacca, polluting the coastal areas as far north as Selangor threatening the livelihood of local fishermen. Realising the imminent danger of this incident to the marine environment, the coastal States of Malaysia and Singapore intervened and worked together in the clean up operations. In 2010, the collision between the vessel MV Waily and MT Bunga Kelana 3 spilled 2, 000 tonnes of light crude oil into the Strait of Singapore. The passage of both vessels was suspended and the local authorities co-operate to contain the oil from drifting to the shores.

The Straits of Malacca and Singapore enjoy the first level of environmental protection. This general obligation to protect the marine environment of the Straits from vessel-source pollution is spelled out in the LOSC and IMO conventions on vessel-source pollution such as the International Convention for the Prevention of Pollution from Ships, 1973, as modified by the Protocol of 1978 relating thereto (MARPOL 73/78) and its six technical Annexes as well as the International Convention on the Control of Harmful Anti-fouling Systems on Ships (BWM).

The littoral states and the users of the Straits have a general obligation to protect and preserve the marine environment of the Straits, as provided under international law. As safe navigation would minimise the risk of maritime casualties which would ultimately protect the marine environment from vessel-source pollution, the IMO has also introduced international rules and regulations as embodied in the Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs), as amended and the International Convention for the Safety of Life at Sea 1974 (SOLAS). Even though the littoral states are state-parties to most of these conventions, nevertheless, their powers to regulate shipping in their territorial Straits are limited by the application of Parts III and XII of the LOSC. The provisions of these IMO conventions can only be effectively carried out via the flag state or port state jurisdictions and not through the coastal state jurisdiction.

To remedy this incapacity, the LOSC has encouraged the formation of co-operation between states bordering straits and the user states, as stipulated in its Article 43. As safe navigation would minimise the risk of maritime casualties which would ultimately protect the marine environment from vessel-source pollution, the IMO has also introduced international rules and regulations as embodied in the Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs), as amended and the International Convention for the Safety of Life at Sea 1974 (SOLAS).

The Co-operative Mechanism is developing, with more user states now willing to contribute, particularly to projects undertaken by the Project Co-ordination Committee. Malaysia received US\$6 million to manage and maintain aids to navigation in the Straits of Malacca and Singapore (Lee, 2017). Nonetheless, voluntary contribution to the Aids to Navigation Fund has not been able to fully cover the cost of maintenance and replacement of navigational aid facilities (Update on the Aids to Navigation

Fund Under the Cooperative Mechanism Between The Littoral States and User States On Safety of Navigation And Environmental Protection In The Straits Of Malacca and Singapore, 2012).

Shipping traffic in the Straits of Malacca and Singapore is projected to increase up to 150,000 vessels per annum by 2020 (Rusli & Mohamad, 2014). As a result, the application of Level 1 category environmental protection measures in the Straits of Malacca and Singapore may not be entirely sufficient to effectively protect and preserve the marine environment of the Straits from vessel-source pollution. Given that transiting shipping accounts for over 80 per cent of the overall traffic in the Straits and brings with it the principal risks of navigational and pollution hazards (Marlow & Gardner, 2006), this article discusses the potential designation of the Straits as a 'Special Area' under MARPOL 73/78.

2. Problem Statement

Now we analyse the issues about the 'special areas' under Marpol 73/78. The potential IMO tool available to protect the marine environment of the Straits of Malacca and Singapore specifically from operational vessel-source pollution is by the proposed designation of the Straits as a Special Area (Caminos & Cogliati-Banz, 2014). Resolution A. 927(22) on 'Guidelines for the Designation of "Special Areas" under MARPOL 73/78 and Guidelines for the Identification and Designation of Particularly Sensitive Sea Areas' of 29 November 2001 described a Special Area as:

«...a sea area where for recognised technical reasons in relation to its oceanographical and ecological conditions and to the particular character of its traffic, the adoption of special mandatory methods for the prevention of sea pollution by oil, noxious liquid substances, or garbage, as applicable, is required».

The terms 'oceanographical', 'ecological conditions' and 'particular character of its traffic' are defined in Resolution A. 927(22).

Article 2.4 of Resolution A. 927 (22) mentions that consideration for the designation of a 'Special Area' would be given to areas having oceanographic conditions which may cause the concentration or retention of harmful substances in the waters or sediments of the area, including conditions of extreme ice state and adverse winds.

Article 2.5 of Resolution A. 927 (22) explains on the ecological conditions to be fulfilled for a sea area to be considered for a 'Special Area' designation. The sea area should inter alia contain depleted, threatened or endangered marine species, possess high natural productivity as well as having rare or fragile ecosystems such as coral reefs, mangroves, seagrass beds and wetlands. It should also be an important spawning and breeding ground for marine species and represent important migratory routes for sea-birds and marine mammals. In addition, it should be a critical habitat for marine resources and supports large marine ecosystems.

In determining the requirements for the fulfillment of vessel traffic characteristics to support a 'Special Area' designation, Article 2.6 of Resolution A. 927(22) stipulates that the sea area should be an area used for shipping activities to an extent that the operational discharge of vessel-source harmful substances within the requirements of MARPOL 73/78 would be unacceptable in the light of the existing oceanographic and ecological conditions in that area.

Any states proposing to designate a given area within their territorial Sea or EEZ as a Special Area must submit a proposal, containing the definition of the proposed area for designation, including its precise geographical co-ordinates, to the Marine Environment Protection Committee (MEPC) for its consideration. The proposal should also include details and information of the eligibility of the proposed area to be designated as a Special Area based on its oceanographic and ecological characteristics and also the existing environmental pressures from ship-generated pollution (Kachel, 2008). Under MARPOL 73/78, Special Areas are provided with a higher level of protection against operational vessel-source pollution than other areas of the sea. At the moment, there are approximately seven sea areas that have been designated as Special Areas under Annex I (Table 01).

Among the areas that have been designated as Special Areas under Annex I of MARPOL are the Mediterranean Sea, Baltic Sea, Red Sea, Gulfs Area, Gulf of Aden and Oman area of the Arabian Sea.

Table 01. Special Areas under MARPOL 73/78 (Source: IMO)

Sea	Annex I	Annex II	Annex III	Annex IV	Annex V	Annex VI
Mediterranean Sea	X				X	
Baltic Sea	X			X	X	X
North Sea					X	X
Antarctic area	X	X		X	X	
Black Sea	X				X	
Red Sea	X				X	
Gulf area	X				X	
Caribbean sea					X	X

These maritime areas are designated as Special Areas for the following reasons:

- Areas such as the Baltic and the Red Seas are enclosed bodies of maritime space, which are exposed to high risks of pollution;
- Some of the areas listed as Special Areas, such as the Baltic Sea, experience cold temperatures all year long. This may slow down the chemical and biological degradation process of certain pollutants;
- The Baltic region, for example, has many complex archipelagos and deeply cut and indented coastlines, such as areas around the Finnish Aaland Islands and the Ostrobothnia region. This may result in difficulties in carrying out clean-up operations should an oil or other chemical spill take place in that area;
- These areas have a high concentration of certain pollutants. For example, there are large oil slicks in the Gulfs Areas;
- Some of the designated areas are important chokepoints for oil transportation and possess high navigational traffic, such as the Red Sea and the Gulfs Areas;
- The areas need to be protected as they are scientifically and socio-economically important for the coastal population. For instance, the Red Sea and the Gulf Areas are rich in marine biodiversity and the coastal populations depend on them to carry out fishing activities.

The Revised Annex I of MARPOL 73/78 imposes stricter conditions on oil tankers discharging oil or oily mixtures both in Special Areas and non-Special Areas, shown in Table 02.

Table 02. The Differences between the Permissible Discharge of Oil by Oil Tankers in Special Areas and Non-Special Areas (Source: IMO)

Non-Special Areas (Regulation 34(A) of Resolution MEPC 117(52))	Special Areas (Regulation 34 (B) of Resolution MEPC 117(52))
The tanker may discharge oil or oily mixtures if it is more than 50 nautical miles from the nearest land	Any discharge into the sea of oil or oily mixture from the cargo area of an oil tanker shall be prohibited while in a special area. Nevertheless, the prohibition does not apply to the discharge of clean or segregated ballast into the sea
The tanker is proceeding en route	
The instantaneous rate of discharge of oil content does not exceed 30 litres per nautical mile	
The total quantity of oil discharged into the sea does not exceed for tankers delivered on or before 31 December 1979, 1/15000 of the total quantity of the particular cargo of which the residue formed a part, and for tankers delivered after 31 December 1979, 1/30,000 of the total quantity of the particular cargo of which the residue formed a part	
The tanker has in operation an oil discharge monitoring and control system and a slop tank arrangement	

Table 02 shows that there are major differences between the oil discharge prohibitions in Special Areas and non-Special Areas. As waterways that are burdened with heavy navigational activities, the Straits of Malacca and Singapore are potential candidates for designation as Special Areas under MARPOL 73/78 (Khee-Jin, 1998). However, it is important to examine whether the Straits fulfil the criteria prescribed in the IMO Guidelines for designation as Special Areas and what would be the political issues surrounding such a designation.

3. Research Questions

Now we discuss the questions about about the ‘special areas’ designation for the straits of Malacca and Singapore. The Straits of Malacca and Singapore are comparable to the Red Sea and the Gulfs Area, which are also among the world’s most significant sea routes for oil transportation and which have been designated as Special Areas. Like the Straits of Malacca and Singapore, the Red Sea and the Gulfs Area are not exposed to icy conditions as these marine areas are located in a tropical climate zone where the weather is hot and humid with air temperatures ranging from 22°C to 30°C (Hase et al., 2006). The Strait of Hormuz in the Gulfs Area is an important waterway for oil transportation, accounting for about 40 per cent of the world traded oil (Cordesman, 2007). The Strait is deep and wide enough to accommodate the world’s largest crude oil tankers and two-thirds of oil shipments carried by tankers transiting the Strait of Hormuz are in excess of 150,000 deadweight tons (DWT).

Similarly, the Straits of Malacca and Singapore are important maritime highways for oil transportation, particularly for transporting oil between the Middle East and the Far East, specifically to Japan, which in 2006 depended on the Middle East and Africa for 84.7 per cent of its crude oil supply and

25.9 per cent of its liquefied natural gas supply (Sakamoto, 2008). About 15.2 million barrels of oil pass the Straits of Malacca and Singapore everyday in 2017 (Mauldin, 2017).

The Persian Gulf is rich in marine biodiversity. A wide variety of marine life is found in the Gulf, including sea turtles, marine birds, dugongs, whales, dolphins and over 500 fish species (Wabnitz et al., 2018). These animals are endemic to the Gulf and rely heavily on its environment for their survival. The fishing industry in the Persian Gulf has been important to the coastal population for centuries, but the per capita fish catch has been slowly dwindling. This is due to adverse climatic and ecological conditions and unsustainable fishing practices. The abundance of major target species like shrimp, Spanish mackerel and various other fish stocks is declining.

The Straits of Malacca and Singapore are also rich in marine biodiversity. Certain areas in the Straits are high in coral reef concentration with a total assessed value of U.S. \$563 million for tourism, shoreline protection, fisheries and scientific research potential (Junaidi, 2017). The coastal areas along the Straits of Malacca and Singapore have abundant mangrove forests, seagrass beds, coastal peat swamps, mudflats and sandy beaches, which are home to various species of flora and fauna. Fisheries industries are also important in the Straits, particularly in the Strait of Malacca. Almost 44 per cent of fish landings in Malaysia came from the Strait of Malacca in 2007 (Hooi, 2008). Fisheries products derived from mangrove areas in the Straits of Malacca and Singapore are valued at US \$358 from Malaysia and about US \$168 million from Indonesia. The annual average total value of marine resources in the Straits is about US\$7,124 million, which consists of both market and non-market resources (Jagerroos, 2016).

The Red Sea contributes significantly to Egypt's marine tourism industries. The rich concentration of coral reefs has lured 1.2 million tourists annually, generating U.S. \$1.2 billion in foreign exchange and creating more than 275,000 jobs (Egypt: Red Sea Sustainable Tourism, 2011). Similar circumstances apply in the Straits of Malacca and Singapore. The marine tourism industries of the littoral states depend on the appealing beaches and islands located along the length of the Straits. One of the main sources of pollution in the Red Sea comes from shipping activities, as it is a main route connecting Europe and Asia, particularly after the opening of the Suez Canal. Any ship-sourced pollution incidents would adversely affect the well-being of the littoral states' economies.

Based on these facts, it is arguable that not only do the Straits of Malacca and Singapore potentially fit the requirements for the designation of a Special Area set by Resolution A. 927 (22), they also have similar attributes to other sea areas that have been designated as Special Areas under MARPOL 73/78, particularly the Gulfs Area and the Red Sea.

4. Purpose of the Study

We believe that a case could be mounted for their designation as a Special Area under the IMO Guidelines to further protect the marine environment of the Straits of Malacca and Singapore from vessel-source pollution (Ansari & Kamal, 2005). A study on the need for, and feasibility of, designating the Strait of Malacca as a Special Area under MARPOL 73/78 was undertaken jointly by the Global Environment Facility (GEF), United Nations Development Programme (UNDP) and the IMO in (Malacca Straits: Special Area? The Need and Feasibility of Designating the Malacca Straits as a Special Area under MARPOL 73/78, 1997). This study made the following recommendations:

- That the littoral states of the Strait of Malacca prepare proposals to designate the Strait as Special Areas under Annexes I and V;
- That a proposal not be prepared to designate the Strait as a Special Area under Annex II at present; The study conducted by the GEF/UNDP/IMO found that the worst pollution caused by operational discharges from ships sailing through the Strait of Malacca is restricted to oil, and not so much with regard to noxious liquid substances and garbage.
- That further studies on oceanographic conditions of the Strait of Malacca should be undertaken as information on this is limited;
- That a discussion should be held between the littoral states and the maritime states in relation to the proposal on the Strait of Malacca Special Areas;
- Annex I of MARPOL 73/78 prohibits oil tankers discharging oil or oily waste in areas within 50 nautical miles from the nearest land. Nevertheless, they are allowed to do so in areas more than 50 nautical miles from the shore, but only in certain quantified amounts as explained in Table 01. Most southern parts of the Strait of Malacca, including the whole stretch of the Strait of Singapore, are no more than 50 nautical miles to the nearest land. Therefore, it would be of no consequence if the southern portion of the Strait were to be designated as a Special Area under Annex I as oil tankers are already prohibited from discharging oil and oily waste in that area. Nevertheless, for reasons of clarity, it is recommended that the definition of the Strait of Malacca Annex I Special Area include those parts of the Strait that are within 50 nautical miles from the nearest land;
- In addition to the defined Strait of Malacca Special Area, the special discharge standards with regard to oil should also apply in neighbouring areas such as the Andaman Sea, the South China Sea and the Indian Ocean off Sumatra. It was also recommended that a study be carried out to determine the feasibility of designating these areas as Special Areas so that they could act as an environmental buffer zone to the Strait of Malacca;
- The littoral states of both the Straits of Malacca and Singapore should ratify MARPOL 73/78 and its annexes and implement these provisions in their legislation and provide enough port reception facilities to make the Strait of Malacca a successful Special Area. One of the reasons why the Red Sea Special Area Annex I has yet to come into force despite having been designated is because the coastal states have not made proper arrangements to ensure that there are enough reception facilities for ships that call at ports in the Red Sea;
- The littoral states should also develop a strategy on how to effectively enforce the Strait of Malacca Special Area under Annex I, in particular by considering the use of aerial surveillance.

5. Research Methods

Institute of the international maritime law is a difficult, complex legal phenomenon. This legal institution is regulated both by the norms of international law and the specific norms of maritime law. Accordingly, the study takes a comprehensive approach to the consideration of legal relationships arising in the field of international maritime law that consists of using the methods implemented by the science of international law and by the science of maritime law. Comparative-legal, analytical, formal and logical

methods combined with a systematic approach to the analysis of problems in the sphere of legal regulation of maritime law by the international legislation form the basis of this scientific work. Application of the analytical method has particular importance as the concept of this article includes an analysis of the international legislation in the sphere of Marine environment.

6. Findings

If a proposal to designate the Strait of Malacca as a Special Area under Annex I was to be submitted to the IMO, arguments for and against the proposal would be expected. Firstly, it may be argued that it is not necessary to designate the Straits as Special Areas under MARPOL. Given the fact that the entire length of the Strait's most critical areas, namely from One Fathom Bank to Horsburgh Lighthouse at the eastern end of the Strait of Singapore, have breadths of less than 50 nautical miles from the nearest land, the designation of Special Areas under Annex I is not necessary, as Annex I to MARPOL 73/78 already stipulates that oil tankers are forbidden to discharge oil or oily waste in these areas. This is however, is not entirely true. The northern parts of the Strait of Malacca, especially in areas north of One Fathom Bank to its western entrance to the Andaman Sea, are considerably wider in breadth. As shipping traffic will increase in future years, it is essential to designate the whole Strait of Malacca, including its southern portion and the Strait of Singapore, as Special Areas under Annex I.

Secondly, it may be argued that there are insufficient reception facilities in ports along the Straits of Malacca and Singapore for these Straits to be designated as a Special Area. This contention was supported by the study undertaken by GEF, UNDP and IMO in 1997. However, this study was made in 1997 and port facilities have improved since then. The most recent study on reception facilities in Malaysian ports was conducted by the Maritime Institute of Malaysia in 2004. The study reported that reception facilities in Malaysian ports increased from 22 to 27 respectively (Osnin, 2004).

According to a report released in 2013 published by the Cooperative Mechanism of the littoral States with the co-operation of BIMCO and INTERTANKO, Singapore has adequate reception facilities and hosts ASEAN's largest port reception facilities for the collection, treatment and disposal of oil slop and sludge and other hazardous waste streams, in Pulau Sebarok ("Port Reception Facilities Booklet Straits of Malacca and Singapore," 2013). Singapore has legislated for port reception facilities as embodied in the Prevention of Pollution of the Sea (Reception Facilities and Garbage Facilities) Regulation. The Prevention of Pollution of the Sea (Reception Facilities and Garbage Facilities) Regulation is a subsidiary legislation of Singapore's Prevention of Pollution of the Sea Act governing matters on port reception facilities for vessels calling at the Port of Singapore.

Indonesia has domestic legislation on port reception facilities as enforced in the Decree of the Minister for Communication 215 Year 1987 (Decree 215/1987). Articles 2 and 3 of Decree 215/1987 ensure the availability of port waste reception facilities in Indonesian major ports; namely, Belawan in Sumatra, Tanjung Priuk in Jakarta, Tanjung Perak in Surabaya and Makassar. For example, the Belawan Port has a waste water treatment facility covering an area of 80 square metres and a solid waste collection facility covering 200 square metres (Indraningsih, 2006).

Indonesian ports that are situated in other sea areas leading towards the Straits of Malacca and Singapore like Tanjung Priuk and Tanjung Perak in the Java Sea have also been equipped with waste

reception facilities (Hambali, 2004). The Obligatory Notification UK 112/40/18/AD.TPK issued in December 2009 prohibits every ship that stops by or moors in Tanjung Priok Port in Jakarta from throwing any waste or garbage into the water and surrounding areas. These materials can only be discharged using waste reception facilities provided by the port authorities. These facts show that the main ports along the Straits of Malacca and Singapore and those in sea areas leading to the Straits have sufficient port reception facility infrastructure for the potential designation of a Special Area under MARPOL 73/78.

The following Table 03 summarises Annex I Port Reception Facilities in ports located along the Straits.

Table 03. MARPOL 73/78 Annex I Port Reception Facilities in Straits of Malacca and Singapore (Source: IMO, 2016)

Port	Oily bilge water	Oily residues (sludge)	Oily tank washings (slops)	Dirty ballast water	Scale and sludge from tanker cleaning	Oily mixtures containing chemicals
Singapore	Yes	Yes	Yes	Yes	Yes	No
Jurong	Yes	No	Yes	Yes	No	Yes
Pulau Bukom	N/A	N/A	Yes	Yes	No	Yes
Pulau Sebarok	No	Yes	Yes	No	No	No
Penang (Georgetown)	Yes	Yes	Yes	Yes	Yes	Yes
Tanjung Pelepas	Yes	Yes	Yes	Yes	Yes	Yes
Tanjung Periok	Yes	Yes	No	Yes	Yes	Yes
Tanjung Perak	No	Yes	No	No	No	No
Blang Lancang	No	No	Yes	Yes	No	No

In any case, the lack of port reception facilities in ports in the Strait of Malacca is not as significant as in other sea areas, as most of the shipping traffic transiting the Straits is classified as ‘long-haul though traffic’, that is, most vessels do not call at any ports situated along the Straits (Simon, 2011), with the exception of the port of Singapore (Foon, 2017). Taking this into consideration, it is arguable that the available port reception facilities would satisfy the requirements of MARPOL 73/78 and would be sufficient if the Strait of Malacca were to be designated as a Special Area.

The three littoral states that border the Straits of Malacca and Singapore are parties to MARPOL 73/78 but collectively they have only ratified two Annexes, i.e. Annex I and Annex II. Therefore it is not viable to designate the Strait of Malacca as a Special Area under Annex V, as Indonesia is not a party to this annex (Yong, 2011). It may also be argued that it would not be possible to designate the whole of the Strait of Malacca as a Special Area because Thailand, a country that borders the Strait at its northern part, is not a party to MARPOL 73/78 or any of its Annexes. However this argument would not prevent the designation of a Strait of Malacca Special Area as Thailand borders only a small portion of the northern part of the Strait as it joins the Andaman Sea. As Malaysia, Indonesia and Singapore have all ratified

Annex I and most of the vessels that ply the Strait are oil tankers, designation of the Strait as a Special Area under Annex I would appear to be most appropriate.

Apart from Special Areas under MARPOL 73/78, Particularly Sensitive Sea Area (PSSA) is also an equally important mechanism to protect and preserve the marine environment as discussed in Footnote 1 of this article. PSSA is an ecologically, economically and scientifically significant area which could be negatively affected by shipping and which requires protection through the action of the International Maritime Organization (IMO). PSSA designation is outside the scope of MARPOL 73/78 (Kachel, 2008). In addition, the criterias for the identification of PSSAs and that of Special Areas under MARPOL 73/78 are not mutually exclusive but both are measures to reduce the marine environmental impacts from shipping activities (Freestone & Harris, 2017). Out of 17 PSSAs all around the world, the Tubbataha Reefs Natural Park, Sulu Sea, Philippines is Asia's only PSSA designated in 2017 ("Particularly Sensitive Sea Area", 2018).

The Straits of Malacca and Singapore are considered to have fulfilled the requirements for the designation of PSSA (Rusli, 2012a). As such, Malaysia is applying to designate areas between Kukup to Tanjung Piai, both located at the southern end of the Malaysian state of Johor as a PSSA. The application however was protested by Indonesia whose main focus is for Putrajaya and Jakarta to resolve maritime boundary issues between the two countries in the Strait of Singapore first before such PSSA designation is to be made (Kaur, 2018). Taking this factor into consideration, it is vital for the three littoral States of Malaysia, Singapore and Indonesia to work together in determining areas to be designated as Special Areas under MARPOL 73/87 should these littoral States are serious in doing so. At the moment, the governments of the littoral States have yet to decide on future proposals for the proposed designation of the Straits of Malacca and Singapore as Special Areas.

7. Conclusion

The Straits of Malacca and Singapore have been important maritime conduits for hundreds of years. The increasing shipping traffic has exposed the Straits to risks of vessel source pollution. Although accidental spills discharge oil in large amount, efforts have been taken by littoral States to minimise collision in the Straits. The actual threat to the marine environment is actually is operational discharges from vessels that take place every time ships transiting the Straits. These arguments reinforce the case for designating the Straits of Malacca and Singapore, or the Strait of Malacca itself, as a Special Area under MARPOL 73/78 particularly under Annex I. Oil pollution is a significant challenge as there are no viable maritime passageways connecting East and West apart from the Straits of Malacca and Singapore.

To support such a case, however, a further and continuous study on the oceanographic characteristics of the Strait needs to be undertaken as this information is still lacking. The previous study by GEF, UNEP and the IMO was made in 1997 and there is a need for an update. However, considering significant improvements made to ports along the Straits of Malacca and Singapore quite recently in terms of the availabilities of reception facilities, there is no doubt that such a designation (particularly on Annex I) is possible in years to come.

This would ultimately enhance the protection and preservation of the marine environment of the Straits of Malacca and Singapore as vessel-source pollution could be better controlled and monitored.

Taking lessons from the recent proposal of PSSA designation of Kukup and Tanjung Piai in Malaysia, unless the littoral States work together, the proposed designation of Straits of Malacca and Singapore Special Areas would face difficulties and challenges.

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