Introduction

Straits of Melaka and Singapore – Vital Shipping Lane

The Strait of Melaka (also known as Malacca) and Singapore is one of the busiest stretches of water in the world. Located between Malaysia to the east and the Indonesian island of Sumatra to the west, the strait extends for about 800 kilometres from north to south. The strait is a narrow and crowded seaway, shaped like a funnel, with the mouth opening in the north. The strait is widest around Penang Island, extending for about 120 nautical miles where it narrowest point is only about nine nautical miles, close to the adjoining Strait of Singapore.

Currently, the Strait of Melaka stands as one of the most important shipping lanes in the world, both economically and strategically. Its links the Indian Ocean to the Pacific Ocean, connecting the East and the West as illustrated below.
In 2004, the IMO have launched the initiatives to protect vital shipping lanes around the world, with the aims to enhance safety, security and environmental protection. The straits of Malacca and Singapore subsequently known as the Straits were chosen as the IMO first initiative.

One key initiative was the Routeing System which incorporated a Traffic Separation Scheme (TSS) and rules for vessels moving in the Straits. In implementing the Routeing System, the three littoral States conducted joint hydrographic surveys in the Straits, carried out tidal and current studies, and installed new aids to navigation to support the TSS. The Routeing System was approved by the International Maritime Organization in 1977 and implemented in 1981.

Later in 1993 a mandatory ship reporting system (or STRAITREP) introduced in the Straits. This system was to enable the shore-based authorities to update transiting ships on the traffic situation and to contribute positively towards search and rescue response and operations to marine incidents in the Straits. The STRAITREP was implemented in 1998. Since then, the monitoring of ships passing through the Straits were made more efficiently and the number of ships reported have shown steadily increased as shown in graph below.

![Ships Reported via STRAITREP 2005 - 2014](source: Marine Department Malaysia, 2015)

To complement the efficiency of the STRAITREP, revised Routeing System and amended Rules for Vessels Navigation through the Straits of Malacca and Singapore were introduced, with a new designed of the Routeing System approved by the IMO in 1997 with the upgrading and establishing new aids to navigation to appropriately demarcate the revised Traffic Separation Schemes as illustrated below.
Monitoring ships in the Straits

Designing the Traffic Separation Schemes in the Straits was based on many observations of shipping traffic passing through the Straits. Monitoring the ships based on the type, flag, trend and pattern even the cargoes they carried when they passed through the Straits. The statistics collected were then used for academic, economic and even for safety and environmental protection strategy purposes.

Analyses of data may also be used:
- for enhancing the capabilities to improve the existing infrastructures and human resource capabilities;
- for identify potential risks;
- for the preparation to enhance the ability to react in the event of crisis.

Nevertheless, one of the main important objectives to monitor shipping traffic in the Strait is the ability for the maritime administration to manage the traffic. This in turn, will make the traffic in the shipping lane more organise and safe for. Availability of relevant information that can be shared by shore station, provided in the Marine Electronic Highway may further assist the Master to plan their voyage safely.

How ship’s been monitored in the Straits

Traditionally, naked eye observation during day time was among the most effective method in monitoring ships in those days. Lighthouse keepers were stationed at the One Fathom Bank lighthouse for several months in rotation, recorded numerous
types of ships, their flags and port of registry for the administration to gained the physical ships statistics passing through the Straits. These statistics in turn, used to develop the surrounding economic and enhancement of the safety of navigation in the Straits. Telescope was then used by the Lighthouse keepers before the binoculars introduced to improve their record keeping.

Radio communication via the shore coast stations services was later being introduced in the 1980’s. The shipmasters’ were compelled to report their whereabouts at particular checkpoints marked on the charts together with a list of ships particulars needed to be reported to the shore coast station listed in the Admiralty List of Radio Signal (ALRS) which published in several volumes.

Modern technologies kept on evolved and monitoring ships have become less physical. The introduction of radar system using electrical pulses has now become primary methods to monitor the ships in the Straits. It’s not only monitor the physical aspect of the ships but with radar, the ships movement can be tracked and recorded.

The evolution of technology doesn’t stop there, the need to know about ships information without depending on the information relay via radio communication. Radio frequencies which were used as voice communication mode then modified as carrier of specific data. An Automatic Identification System (AIS) were then introduced for ships and shore to provide more information about the ships passing through the Straits via the AIS Based Stations.

**Challenges in monitoring ships**

Although technology innovations have made monitoring of ships in the Straits becoming a lot easier, however, challenges still remains ahead as there were relying on the users to provide the required data. Further to that, messages relay via radio communication need to be received by the shore station in the utmost good faith. Often the case, ships do not provide enough information nor do they report to the shore station. These ships may not equip with AIS or switch off the equipment for their own reason.

Availability of technology on-board ship and ashore also need to be at tandem. Often the case, modern ship equipped with latest technology, in contrary, the shore or coast station will take more time as there were no requirements for them to comply. The implementation of Global Maritime Distress Safety System (GMDSS) on-board ships were implemented well since 1999. However, there many shore or coast station still not able to supported with the equipment.

Having a world class expensive high technology infrastructure to monitor ships in the Straits alone may not be ideal without human intervention. Capable human resource to operate the equipment efficiently and ability to communicate with the
ships effectively may be continuous challenges for the maritime administration. Without motivated and capable personal to handle the ships monitoring equipment may shattered the purpose and objective of it.

**Summary**

Enhancements of technologies for ships monitoring equipment have improved managing traffic in the Straits and further enhance the maritime trade in this region. Although the number of shipping traffic steadily increase but with proper equipment and high capability of human resource will further increase the ability to manage the traffic in the Straits.

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