Possible Ways of Cooperation to Protect Sea Lines of Communications (SLOC): The Marine Electronic Highway Project in the Straits of Malacca and Singapore

Submitted by: IMO
Possible Ways of Co-operation to Protect SLOC

The Marine Electronic Highway Project in the Straits of Malacca and Singapore

Straits of Malacca and Singapore

- Coastal and marine natural resources – enormous value to littoral States, contribute to global economy.
- Estimated at US$15 billion net economic value
- Livelihood of 30 million people living in the vicinity
- Zone of biodiversity, rich in marine fauna and flora in a tropical estuarine environment
- Stopover points for migratory birds on seasonal transition
Some 600 ships use the Straits daily, 250 – 270 vessels transited the Straits annually, over the past 5 years, vessel arrival in Singapore was over 130,000.

High level of local traffic engaged in trade and fishing across the Straits.

Provides the shortest route to connect the Far East with the Indian Ocean and the Middle East compared with other routes.

Straits of Malacca and Singapore is shorter by approximately 1,000 nautical miles, a saving of about three days’ steaming if compared with the two alternative routes, i.e., Lombok-Makassar and the Sunda Straits.

Improving navigational safety – littoral States.

Marine pollution prevention and navigational aids maintenance – Japan – significant donor.

Singapore’s Vessel Traffic Information Services (VTIS)

Malaysia also has a radar and vessel traffic monitoring systems and AIS stations

Mandatory Ship Reporting System, STRAITREP, came into effect on 1 December 1998, requires designated vessels to report, via VHF voice radio communications, to the marine authorities of the littoral States when transiting the Straits of Malacca and Singapore.
Current maritime safety infrastructure and regulatory mechanisms in place in the Straits have improved the safety of navigation, flow of vessel traffic and the overall management of the Straits as an international sea lane.

Also there is a substantial volume of cross-Straits traffic among the three littoral States involving trade and fishing.

There is substantial growth in container throughput in the three largest container ports in Malaysia and Singapore over the past three years.

The biggest concern is the risk of a catastrophic oil spill following a collision with or a grounding of a VLCC or any vessel carrying large quantities of bunker oil.

Outlay for the EVOIKOS oil spill incident came to about US$7.5 million.
With the increasing volume of maritime traffic and port development in the Straits, the capacity and condition of the Straits to handle such growth whilst ensuring safe and efficient navigation remains a source of concern.

Clearly, an innovative approach to improving the management of the maritime traffic and marine environment protection would be required and it is hoped that the Marine Electronic Highway System (MEH) will provide a solution to this concern.

What is an MEH?
An innovative marine information and infrastructure system that integrates environmental management and protection systems and maritime safety technologies for enhanced maritime services, better navigational safety standards, integrated marine environment protection and sustainable development of the coastal and marine resources.
Three Elements of an MEH

**NAVIGATIONAL SAFETY**

**ENVIRONMENT**

**SUSTAINABLE FINANCING**

**PRECISION NAVIGATION**

- Differential Global Positioning System Broadcast Service (DGPS)
- Vessel Traffic Information System (VTS)
- Electronic Chart Display and Information System (ECDIS)
- Automatic RADAR Plotting Aid (ARPA)
- Universal Automatic Identification System (AIS)
- Electronic Navigation Chart (ENC)
Maritime Electronic Highway
Functional Diagram

Applications Module
- oil spill
- search and rescue
- tanker drift
- tsunami / surge wave forecasting
- tides and currents
- fishery forecasts
- ocean productivity
- hazardous plankton forecasts
- effluent dispersion
- contaminant fate and effects

Goals
- emergency response
- electronic navigation
- traffic management
- resource management and intervention
- environmental protection

Data Interface
- VTIS
- GPS
- radar

In situ obs.

3D circulation model
- hydrodynamics
  - s, T, δt
- plus 3D ecology model
  - plankton
  - nutrients
  - sediments
  - contaminants

MEH Information Flow Schematic

Resource Managers, etc:
- aquaculture
- fisheries
- coast guard
- oil spill response
- coastal management
- tourism
- EIA
- pollution control
- emergency response

E C D I S
- Vessel operators
- Cargo owners / ground transportation companies
- Port operators
- Maritime surveillance / agencies

Information Network

Digital Products

VTIS
Radar
GPS
Satellite imagery
Winds, Currents, Tides (real-time)

Environmental Monitoring

Image Processing, Modeling/forecasting

MEH Node

Digital Products
Information and Communication Technology (ICT)

Flow:
- Two-way Voice, Voice Band Data, Interactive, Pipeline

Via:
- Telephony; Telemetry, and Internet (Virtual Private Network)

World Wide Web
Fixed Line, Wireless, Satellite
Internet Protocol
E-mail facility
Broadband Gateway
SUSTAINABILITY OF THE MEH

Institutional Arrangements:

Project Steering Committee → Managing Tool

Financing Arrangements:

MEH Fund → MEH Operations and Management
MEH Fund → Environmental Trust Fund

Financial Sustainability of the MEH

- Public Private Sector Partnerships
- Revenues from Products and Services

Considerations to Generate Revenues:

- UNCLOS (Art. 26 and Art. 43)
- SOLAS (Minimum Threshold of NAVAIDS)
### Some Benefits of the MEH System

<table>
<thead>
<tr>
<th>Service</th>
<th>Sectoral Benefits</th>
<th>General Benefits</th>
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<tbody>
<tr>
<td>Enhancement of navigational safety</td>
<td>Reduce risks of groundings &amp; collision, increase operational efficiencies of vessels</td>
<td>Enhance commercial performance, modernization</td>
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<tr>
<td>Improvement in vessel traffic movement</td>
<td>Efficient vessel traffic management, increase payload</td>
<td>Improve maritime security, lower environment-related damage</td>
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<tr>
<td>Enhance and efficient telecommunications</td>
<td>Enhance precision navigation, improve crew morale, real time access</td>
<td>Efficient working environment, downward pressure on running costs</td>
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<tr>
<td>Strengthen dissemination and use of environmental information</td>
<td>Effective monitoring and forecasting, revenue source, improve enforcement</td>
<td>Enhance commercial production, reduce damage claims, improve compliance</td>
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#### Regional Marine Electronic Highway Project

**Phase 1:** Straits of Malacca and Singapore  
- Stage 1: Demonstration Project  
- Stage 2: Full-scale Development Project  
**Phase 2:** Extending the MEH in other sea areas
MEH System and Possible Regional Co-operation to Protect the SLOC

Straits of Malacca and Singapore

- Sustaining Economic Growth
  (trade flow – resources and goods, energy demand, increase merchant fleet)
- Safety of Navigation
- Environment Protection
- Maritime Security
  (conflict, piracy, terrorism, cyber/technological threats, freedom of navigation)
Protecting the SLOC

MEH System...

- Monitoring and Maritime Traffic Management
- Prevention and Response
- Information Flow and Communication
- Security, Safety, Early Warning

✓ Inter-agency Co-operation and Co-ordination
✓ Multilateral Co-operation and Co-ordination
✓ Plan/Programme
✓ Sustained Funding
✓ Legal and Institutional Arrangements
✓ International Co-operation and Co-ordination

Protecting the SLOC

Straits of Malacca and Singapore
MEH System

- Link-up
- Model
Thank You