The United Nations Economic and Social Commission for Asia and the Pacific (ESCAP)

*International Conference on Autonomous Shipping in Asia and the Pacific*

Introduction to ESCAP’s Project on Autonomous Shipping in Asia and the Pacific:

*Improving the Safety of Navigation & the Sustainability of Shipping through the Introduction of Innovative Autonomous Shipping Technology in the Asia-Pacific*

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28th – 29th February 2024
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Scope of Presentation

- **Part 1:**
  - Development & the IMO’s Regulation on Autonomous Shipping
  - Potential Impacts of Autonomous Shipping

- **Part 2:**
  - Current Challenges to Shipping in Malaysia
  - The Analysis & Findings of the Study on Autonomous Shipping in Malaysia

- **Part 3:**
  - Recommendations for Autonomous Shipping in Malaysia
  - Recommendations for Autonomous Shipping in the Asia-Pacific
Part 1: Development of Autonomous Shipping in Europe

• **Europe** is at the forefront of autonomous shipping development

• Examples of projects and initiatives:

  ✓ Kongsberg-Yara Birkeland

  ✓ Maritime Unmanned Navigation through Intelligence in Networks (**MUNIN**)

  ✓ Autonomous Shipping Initiative for European Waters (**Autoship project**)

Kongsberg-Yara Birkeland

MUNIN
Part 1: Development of Autonomous Shipping in Asia and the Pacific

- China, Japan, Republic of Korea, the Russian Federation & the United States of America are the leading countries in the development of autonomous shipping technology

- Examples of projects and initiatives:
  - China’s **Smart Ships**, the 1st autonomous ship, *JinDouYun-0*
  - Japan's **Centre for the Promotion of the Marine Innovation Strategy**, the autonomous ship *Suzaku*
  - Republic of Korea’s **Korea Autonomous Surface Ship Project (KASS)**
  - The Russian Federation’s **Autonomous and Remote Navigation Trial Project (ARNTP)**
  - The United States’ **Automated Maritime Navigation and Control System (AMNCS)**

Source: Marinet, Russian Federation
Part 1: The IMO’s Regulation on Autonomous Shipping

✓ IMO instruments such as the SOLAS, COLREG, MARPOL & ISPS Code are inadequate to regulate the advancement in autonomous shipping

✓ IMO is addressing this challenge by developing a goal-based Maritime Autonomous Surface Ships (MASS) Code

✓ The MASS Code will serve as a guideline to regulate remote control and autonomous operation of ships
Part 1: Potential Impacts of Autonomous Shipping

➢ **Navigation Safety:**
  ✓ Eliminate needless voyages
  ✓ Minimise the occurrence of incidents at sea

➢ **Sustainability of Shipping:**
  ✓ Reduce environment impact
  ✓ Seamless connections with other modes of transport

➢ **Economic, technological, social and human:**
  ✓ Reform workstyles in ocean transport
  ✓ Reduce workload on crew members
  ✓ Reduce logistics costs

Illustration of Potential Impact of Autonomous Shipping
(Source: https://www.mol.co.jp)
Part 2: Current Challenges to Shipping in Malaysia

➢ As a council member of the IMO, Malaysia:
  ✓ Complies with **IMO instruments** such as the SOLAS, COLREG, MARPOL & ISPS Code
  ✓ Participates in the **IMO’s programs** on safety of navigation & reduction of greenhouse gas emissions from ships & ports

➢ However, the **safety of navigation** & the **sustainability in shipping** remain as major concerns in Malaysia

*Malaysia’s participation in the IMO programs*
(Source: Ministry of Transport Malaysia)
Part 2: Current Challenges to Shipping in Malaysia: The Safety of Navigation

➢ Malaysia collaborates the IMO & neighboring nations to improve the safety of navigation by:

✓ The Malacca Strait Patrols and Traffic Separation Scheme help prevent collisions

✓ Malaysian Maritime Enforcement Agency (MMEA) & the Marine Department enforce maritime laws and regulations

➢ However, there are still marine incidents happening in Malaysian waters.
Part 2: Current Challenges to Shipping in Malaysia: The Sustainability of Shipping

➢ Shipping has an impact on **marine ecosystems** and contributing to about 3% of the **global carbon emission** (UNCTAD)

➢ **Maritime law enforcement** by relevant agencies on environmental protection in Malaysian waters

• However, the Strait of Malacca is still challenged with some **maritime sustainability issues such as marine pollution**.
Part 2: Analysis of the Study: The Safety of Navigation in Malaysia

❖ **Strengths:**
  ✓ Safety improvement
  ✓ Enhanced situational awareness
  ✓ Faster response time

❖ **Weaknesses:**
  ✓ Lack of human oversight
  ✓ Limited regulatory framework
  ✓ Limited infrastructure

❖ **Opportunities:**
  ✓ Enhance the sustainability of shipping
  ✓ Real-time risk management

❖ **Threats:**
  ✓ Public acceptance
  ✓ Cybersecurity vulnerabilities
  ✓ Economic implications

Illustration of an autonomous ship

Source: https://sync.cobham.com/
Part 2: Analysis of the Study: The Sustainability of Shipping in Malaysia

❖ **Strengths:**
  ✓ Reduced emissions
  ✓ Increased use of renewable energy
  ✓ Improved coastal monitoring

❖ **Weaknesses:**
  ✓ Potential for environmental accidents
  ✓ Disruption of marine life
  ✓ Regulatory framework

❖ **Opportunities:**
  ✓ Improved environmental sustainability
  ✓ Real-time monitoring and response
  ✓ Advancements in sustainable technology

❖ **Threats:**
  ✓ Potential environmental accidents
  ✓ Disruption of marine ecosystems and wildlife
  ✓ Inadequate enforcement of environmental regulations

Illustration of an autonomous ship
Source: https://www.porttechnology.org/
Part 2: Findings of the Study: Potential Impacts of Autonomous Shipping in Malaysia

1. Improved Safety of Navigation (Strength)

- Autonomous shipping reduces the risk of human error
  - ✓ Advanced sensors, computer systems, and AI can enhance navigation safety
  - ✓ Improved efficiency and reduced costs

Illustration of an autonomous ship

Source: https://sync.cobham.com/
Part 2: Findings of the Study: Potential Impact of Autonomous Shipping in Malaysia

2. Reduced Environmental Impact (Opportunity)

• Autonomous shipping can reduce **greenhouse gas emissions**
  
  ✓ Use of alternative fuels and energy-efficient technology
  
  ✓ Potential for better management of marine ecosystems and reduced pollution

Kongsberg-Yara Birkeland

Source: https://www.offshore-energy.biz/worlds-1st-zero-emission-container-vessel-yara-birkeland-delivered/
3. Increased Cybersecurity Risks (Threat)

- **Autonomous ships** are vulnerable to **cyber attacks**
  - **VTMS** could be a risk to cyber attacks as the current **AIS system** which is an integral part of its system is vulnerable to security breach
  - Threats to **safety** and **security protection**

Source: conference.hitb.org
Part 2: Findings of the Study: Potential Impact of Autonomous Shipping in Malaysia

4. Regulatory Framework (Weakness)

Regulatory framework on autonomous shipping will pose as a challenge:

➢ Need to comply with the IMO’s MASS Code to ensure safe and sustainable implementation

➢ Malaysia to collaborate with other international organisations on autonomous shipping

The International Maritime Organization (IMO)’s News: IMO takes first step to address Autonomous Ships

Source: https://www.imo.org/en/MediaCentre/PressBriefings on May 25, 2018 ·

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Part 3: Recommendations for Autonomous Shipping in Malaysia

1. Enhancing Safety of Navigation

✓ Develop regulations and guidelines for autonomous ships based on IMO’s MASS Code

✓ Provide training and education programs for stakeholders

✓ Conduct regular safety assessments to evaluate performance and identify potential risks

Malaysia’s participation in the IMO programs

(Source: Ministry of Transport Malaysia)
Part 3: Recommendations for Autonomous Shipping in Malaysia

2. Mitigating Environmental Impact

✓ More stringent enforcement on environmental laws

✓ Incentivize the use of clean energy sources

✓ Promote sustainable port infrastructure & waste management

Malaysia’s Contribution to the United Nations’ Sustainable Development Goals (SDGs)

(Source: Mazlin Mocktar, Lee K E & S Sivapalan)
Part 3: Recommendations for Autonomous Shipping in Malaysia

3. Mitigating Cybersecurity Risks

✓ Guided by The National Cyber Security Policy (NCSP) & The Malaysia Cyber Security Strategy (MCSS) 2020 – 2024. the Cyber Security Malaysia (CSM) & the National Cyber Security Agency (NACSA) are to further mitigate cybersecurity risks.

✓ To enhance the VTMS/AIS monitoring system to counter risks to cyberattacks through:

❖ Information-sharing on cybersecurity to prevent threats to safety and security protection

❖ Coordinate training on countering cybersecurity measures
Part 3: Recommendations for Autonomous Shipping in Malaysia

4. Enhancing Regulatory Framework

✓ Enhance regulatory framework with the **IMO’s MASS Code**

✓ Collaborate with international organizations to develop and implement safe & sustainable shipping practices

✓ Coordinate research and development in autonomous technology

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The International Maritime Organization (IMO)’s News: IMO takes first step to address Autonomous Ships

Source: https://www.imo.org/en/MediaCentre/PressBriefings on May 25, 2018 ·
Part 3: Recommended Strategy for Autonomous Shipping in Malaysia

1. Invest in Technological Infrastructure
2. Enhance Navigation Safety
3. Promote Sustainable Shipping
4. Develop a Skilled Workforce
5. Foster Collaboration

Source: https://themapspro.blogspot.com/2019/04/
Part 3: Recommendations for Autonomous Shipping in the Asia-Pacific

1. Establish Regulations and Guidelines
2. Invest in Research and Development
3. Develop a Skilled Workforce
4. Encourage Collaboration and Partnerships
5. Promote Public Awareness

Source: ESCAP
Summary of Presentation

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**Thank You**

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