

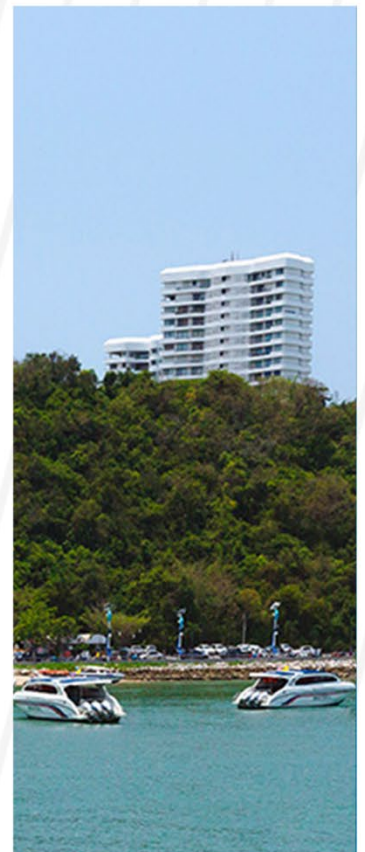
# ***SEA the Future 2023***

*The Second International Conference in South East Asia  
on the Future of Maritime Technology and Use of the Sea*



# **Book of Abstracts**

***27 February – 1 March 2023  
Grande Centre Point Space Pattaya***



***"Towards Sustainable Maritime Community"***



***The Second International Conference in South East Asia on the Future of  
Maritime Technology and Use of the Sea 2023 (SEA the Future 2023)***

*“Towards Sustainable Maritime Community”*

***27 February – 1 March 2023***

***Grande Centre Point Space and Grande Centre Point Terminal 21 Pattaya, Chonburi,  
THAILAND***

***Organized by***

***Faculty of International Maritime Studies, Kasetsart University***

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## ☞ CONFERENCE AT-A-GLANCE ☞

### Monday 27 February 2023

Time	Details
9.00 a.m. – 4.00 p.m.	On-site registration at <i>Grande Centre Point Terminal 21 Pattaya</i>

### Tuesday 28 February 2023

Time	Details			
8.30 a.m.	Conference registration at <i>Grande Centre Point Space and Grande Centre Point Terminal 21 Pattaya</i>			
9.30 a.m.	Message from conference chairs: Dean of the Faculty of International Maritime Studies Welcome message by Vice President for Sriracha Campus Opening remark by Kasetsart University President			
10.00 a.m.	Keynote addresses by Mr. Stephen Ashworth “ <i>The path towards a sustainable future at Hutchison ports Thailand</i> ”			
10.25 a.m.	Keynote addresses by Prof. Volker Bertram “ <i>Future fuels for decarbonizing shipping</i> ”			
10.50 a.m.	<i>Short break</i>			
11.10 a.m.	Keynote addresses by Assoc. Prof. Effi Helmy Ariffin “ <i>Towards sustainable coastal management from Malaysia perspective</i> ”			
11.35 a.m.	Keynote addresses by Prof. Subramaniam Neelamani “ <i>Innovative coastal protection solutions for sustainable management of erosion</i> ”			
12.00 p.m.	Lunch break at <i>Orbit Restaurant, Grande Centre Point Space</i>			
1.00 p.m.	Conference will be categorised into four subsessions:			
	<b>Session: Coastal Engineering and Management</b>	<b>Session: Marine Environment and Management</b>	<b>Session: Navigation, Maritime Logistics and Management</b>	<b>Session: Marine Engineering and Management</b>
1.00 p.m.	FP002	FP006	A019	FP001
1.20 p.m.	A001	A002	FP003	FP007
1.40 p.m.	A007	A005	FP004	A003
2.00 p.m.	A008	A012	FP005	A009
2.20 p.m.	A014	A013	A004	A035
2.40 p.m.	A015	A023	A006	A037
3.00 p.m.	<i>Short Break</i>	<i>Short Break</i>	<i>Short Break</i>	<i>Short Break</i>
3.20 p.m.	A016	A024	A010	A038
3.40 p.m.	A017	A025	A011	A039
4.00 p.m.	A018	A027	A022	A042
4.20 p.m.	A020	A028	A026	-
4.40 p.m.	A032	A030	A029	-
5.00 p.m.	A033	A040	A021	-
5.20 p.m.	A034	-	A031	-
5.40 p.m.	A041	-	-	-
6.00 p.m. – 10.00 p.m.	Dinner at <i>The Amphitheatre, Grande Centre Point Terminal 21 Pattaya</i>			
	Closing speech by Dean of the Faculty of International Maritime Studies			

**Session: Coastal Engineering and Management**

<b>Time</b>	<b>Number</b>	<b>Title</b>	<b>Author/Corresponding author</b>
1.00 p.m.	FP002	The Heritage Impact Study Assessment (HIA) in the Sustainable Development of the Coast of Melaka	Ms. Yasmin Amirah
1.20 p.m.	A001	Coastal Vulnerability Assessment for Future Sea level Rise-Experiences and Case Studies from Kuwait	Prof. Subramaniam Neelamani
1.40 p.m.	A007	Nature based solution for coastal erosion protection in changing climate: contexts and prospects	Ms. Afsana Yasmeen
2.00 p.m.	A008	Mathematical model development project to support building design and construction Navy coastal buildings	Mr. Krisada Innum
2.20 p.m.	A014	Coastline changes along the east coast of Thailand and Peninsular Malaysia	Ms. Lee Shin Yun
2.40 p.m.	A015	Beach morphodynamics influences from seasonal monsoon in Terengganu Coast	Mr. Fadhli Abdul Harris
3.00 p.m.	<i>Short Break</i>		
3.20 p.m.	A016	Assessment of Shoreline Evolution for Kuala Nerus Terengganu coast, Malaysia, using the Digital Shoreline Analysis System Technique	Mr. Amrul Jaahiz Abd Razak
3.40 p.m.	A017	Shoreline Evolution as A Response to Hard Structure Protection at West and East Coast Peninsular Malaysia	Mr. Wan Shiao Dong
4.00 p.m.	A018	Mitigation tool for erosion management in Malaysia: A review	Ms. Anija Natsha Azhar
4.20 p.m.	A020	Sustainable Natural Architectural Design for Sand Dune Restoration as Coastal Protection at the Beach that Prone to Seasonal Storms	Ms. Siti Nur Hanani Zainuddin
4.40 p.m.	A032	Analytical and Numerical Study of Wave Resonance Phenomena in a Basin with Absorbing Wall and Submerged Breakwater	Ms. Indriana Marcela
5.00 p.m.	A033	Wave Shoaling Phenomenon Modelling using Physics Informed Neural Networks (PINNs)	Mr. Gabriel Jonathan
5.20 p.m.	A034	Mangrove Forest for Climate Change Mitigation	Ms. Vincensia Ferren
5.40 p.m.	A041	Validation of abnormal sea surface temperature under coastal upwelling in South Korea with SCHISM-WRF	Prof. Hyung Ju Yoo

<b>Session: Marine Environment and Management</b>			
<b>Time</b>	<b>Number</b>	<b>Title</b>	<b>Author/Corresponding author</b>
1.00 p.m.	FP006	The Environmental and Economic Assessment of using Liquefied Natural Gas as a Fuel Onboard Bulk Carrier Ships	Prof. Ibrahim Seddiek
1.20 p.m.	A002	Contemporary Anthropogenic Challenges Threatening the Indian Ocean Area of Africa: Mitigation and Adaptation	Mr. Babagana Abubakar
1.40 p.m.	A005	Evaluation Compliance on Annex V MARPOL 73/78 Guidelines among Cargo and Passenger Vessels: A case of Philippines' Sea ports	Dr. Jennel B. Orantes
2.00 p.m.	A012	The SEEMP Slow Steaming Performance in Reaching out the Carbon Intensity Indicator	Mr. Angga Prasetya Wibowo
2.20 p.m.	A013	Qualitative analysis of Microplastics impact in Mangroves and their surrounding in Kovalam Fishing village, east coast of India	Dr. Radhakrishnan Nagalakshmi
2.40 p.m.	A023	Marine Pollution: Impact on Ships and Infrastructure on Karachi Harbor	Dr. Sajid Mehmood Shahzad
3.00 p.m.	<i>Short Break</i>		
3.20 p.m.	A024	Environmental Forensic Analysis of the Shoreline Microplastics Debris on the Limbe Coastline, Cameroon	Mr. Eric E. Ndumbe
3.40 p.m.	A025	Blue economy challenges and the different solutions to face these challenges	Asst. Prof. Nourhan I. Ghoneim
4.00 p.m.	A027	Microplastics Contamination in Marine Fishes of Kapas Island, Terengganu, Malaysia	Ms. Noor Alia Ahmad Nordin
4.20 p.m.	A028	Microplastics Contamination in Malaysian Elasmobranchs during Early Ontogeny	Ms. Noraini Nabila bt Nasharuddin
4.40 p.m.	A030	The path to zero carbon shipping	Dr. Martin Kroeger
5.00 p.m.	A040	Taxonomy of Brachyuran Crabs from Andaman and Nicobar Islands, Bay of Bengal, India	Dr. S. Kumaralingam

### Session: Navigation, Maritime Logistics and Management

Time	Number	Title	Author/Corresponding author
1.00 p.m.	A019	An integrated intermodal freight transportation system to avoid container supply chain disruptions in Chittagong port of Bangladesh	Dr. Tarafder Md. Ruhul Saif (Presented by Dr. Razon Chandra Saha)
1.20 p.m.	FP003	The Sustainable Urban and Sea Logistics Planning in the Gulf of Thailand	Assoc. Prof. Rahuth Rodjanapradied
1.40 p.m.	FP004	Semantic Arrangement of Navigational Safety Management	Prof. Bozhena B. Dokuto
2.00 p.m.	FP005	Analysis of the river cruise network in Southeast Asia: A complex network approach	Ms. Maneerat Kanrak
2.20 p.m.	A004	Effective Digital Training Solutions to Support the Maritime	Ms. Tracy Plowman
2.40 p.m.	A006	Spatial-temporal Analysis of ship collision risk using Velocity Obstacle method: a case study in the estuarine waters of Yangtze River	Prof. Pengfei Chen
3.00 p.m.	<i>Short Break</i>		
3.20 p.m.	A010	The capsizing risk assessment index for small fishing vessels	Dr. Nam-Kyun Im
3.40 p.m.	A011	Short Term Impact of Seascout Accident: A Spatio-Temporal Case Study for Al Duqm Sea Area, Oman	Dr. Firat Bolat
4.00 p.m.	A022	The redesign canvas: Conventional logistic into Halal logistic business model canvas (HLBMC)	Ms. Masha Nur Salsabiela Menhat
4.20 p.m.	A026	India's Double Fish Hook Strategy - Technological and Logistical Aspects	Prof. Pankaj Jha
4.40 p.m.	A029	The Promotional Measures for the Thai Merchant Fleet	Dr. Somchart Krailassuwan
5.00 p.m.	A021	A freight transport model to improve multimodal and intermodal freight transport services to the BIMSTEC member countries by centering Chattogram Port	Dr. Razon Chandra Saha
5.20 p.m.	A031	Could untargeted cyberattacks against a vessel constitute a malicious act in the context of marine insurance?	Ms. Fatima Ozcan

<b>Session: Marine Engineering and Management</b>			
<b>Time</b>	<b>Number</b>	<b>Title</b>	<b>Author/Corresponding author</b>
1.00 p.m.	FP001	Teaching Marine Engineering Terms Through On-Line Methods Within the Framework of Training Courses	Prof. Igor O. Smirnov
1.20 p.m.	FP007	Modelling and Analysis of the Voyage Cycle for Ferryboat Electrification	Mr. Brandon Jamos Cipriano
1.40 p.m.	A003	Re-Creating 3D Ship Geometries as Maps for Inspection and Reporting	Prof. Volker Bertram
2.00 p.m.	A009	An Experimental Demonstration of the Methodology for the Simple Assessment of the Safety of Stability of a Training Ship Stability in Real-Time using Roll-Period	Mr. Donghan Woo
2.20 p.m.	A035	Comparison of USV thruster configurations	Asst. Prof. Kantapon Tanakitkorn
2.40 p.m.	A037	Study on the remelting process of Al-Si alloy refined with Al-Ti-B master alloy	Ms. Prapasi Sungsuwan Konchum
3.00 p.m.	<i>Short Break</i>		
3.20 p.m.	A038	The microstructural improvement of Al-Si alloy using Al-Er master alloy	Mr. Rattanapon Jantaki
3.40 p.m.	A039	The microstructure and hardness property alternation of a tool steel using the sub-zero treatment	Mr. Mongkolchai Sanghirun
4.00 p.m.	A042	Marine Digital Twins for Smart and Autonomous Vessel Navigation	Prof. Allan R. Magee

### **Wednesday 1 March 2023**

<b>Time</b>	<b>Details</b>	<b>Remark</b>
10.00 a.m.	Field trip at Laem Chabang Port (convene at Grande Centre Point Pattaya's reception desk)	Participants can choose to participate in either the morning field trip or the afternoon site visit (survey form is to be announced later)
1.00 p.m.	Site visit at Faculty of Maritime Studies, Kasetsart University Si Racha Campus	



## Message from Conference Chairs

**Honourable Delegates, Ladies, and Gentlemen,**

SEA the Future 2023 is a conference focused on sustainable maritime development in South-East Asia under the post-COVID-19 age. The goal is to connect participants with industry leaders, share knowledge, facilitate collaboration, and drive the growth of the maritime industry on a regional and even a global scale.

We are proud to announce the keynote speakers of the conference:

- Prof. Volker Bertram from DNV-GL, Germany,
- Mr. Stephen Ashworth, Managing Director of Hutchison Ports Thailand & South-East Asia,
- Assoc. Prof. Effi Helmy Ariffin from Institute of Oceanography and Environment, Universiti Malaysia Terengganu, Malaysia, and
- Prof. Subramaniam Neelamani, from Coastal Management Program, Environment and Life Sciences Research Centre, Kuwait Institute for Scientific Research, Kuwait

On behalf of the Faculty of International Maritime Studies, Kasetsart University, I am excited to have this valued opportunity to welcome all conference delegates.

Thank you,



Assistant Professor Sarinya Sanitwong-Na-Ayutthaya

Dean of the Faculty of International Maritime Studies, Kasetsart University





## Welcome Speech from Vice President of Kasetsart University Sriracha Campus

Ladies and Gentlemen,

Welcome to the **Second International Conference in Southeast Asia on the Future of Maritime Technology and Use of the Sea, *SEA the Future 2023***.

We are honoured to have distinguished guests and experts from around the world in attendance. The theme of the conference is “*Towards Sustainable Maritime Community*”, which is vitally important for our region and throughout the world.

We are confident that the knowledge, expertise, and technology that we share through coordinated research and innovation will help us build a sustainable future for the maritime industry in South-East Asia and beyond. Discussions and interactions during the conference will foster new ideas and lead to collaborations that will create many opportunities for growth and development.\

I wish to acknowledge and express gratitude to members of the Faculty of International Maritime Studies at Kasetsart University and the other organisers who put in great effort to organise this conference. We are especially grateful for the support and collaboration of all participants.

Thank you,



Assistant Professor Seri Koonjaenak

Vice President of Kasetsart University Sriracha Campus



## Opening Address from President of Kasetsart University

**Distinguished Delegates, Ladies, and Gentlemen,  
Sawasdee. Good morning,**

On behalf of Kasetsart University, I wish to say how honoured we are to host the *SEA the Future 2023* International Conference.

Hosting this conference is more than just an honour for Kasetsart University. It is part of our mission to achieve an “*Internationalisation Leadership Role in Research and Academic In Thailand*”. We know we can best fulfil our commitment by promoting research in cooperation with other academic and commercial institutions.

This conference has important goals to focus on sustainable maritime uses and to discuss the role of researchers and advanced thinkers in fields related to maritime technology in order to address many serious global challenges that confront all of us.

The theme “*Towards Sustainable Maritime Community*” provides a platform for our university partners and our industrial and commercial partners to exchange knowledge and expertise in a variety of fields related to maritime technology and the use of the sea. I wish to acknowledge the role of our Faculty of International Maritime Studies in promoting collaboration and innovation in these areas. What we learn today will enable us all to think and act more clearly so that we can resolve the regional and global challenges that we all are facing.

It is, indeed, a great honour to have an opportunity to welcome all participants.

And now, Ladies and Gentlemen, it is the right time to begin the conference.

Thank you,



Jongrak Watcharinrat, Ph.D.

President of Kasetsart University

## **Keynote Speakers**

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### **The path towards a sustainable future at Hutchison ports Thailand**

Mr. Stephen Ashworth, Managing Director – Thailand & South East Asia, Hutchison Ports

### **Future fuels for decarbonizing shipping**

Prof. Dr. Volker Bertram, DNV-GL, Hamburg, Germany

### **Towards sustainable coastal management from Malaysia perspective**

Assoc. Prof. Effi Helmy Ariffin, Universiti Malaysia Terengganu (UMT), Malaysia

### **Innovative coastal protection solutions for sustainable management of erosion**

Prof. Subramaniam Neelamani, Kuwait Institute for Scientific Research, Kuwait

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## **Sessions : Coastal Engineering and Management**

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- 1) **The Heritage Impact Study Assessment (HIA) in the Sustainable Development of the Coast of Melaka**
  - 2) **Coastal Vulnerability Assessment for Future Sea level Rise-Experiences and Case Studies from Kuwait**
  - 3) **Nature based solution for coastal erosion protection in changing climate: contexts and prospects**
  - 4) **Mathematical model development project to support building design and construction Navy coastal buildings**
  - 5) **Coastline changes along the east coast of Thailand and Peninsular Malaysia**
  - 6) **Beach morphodynamics influences from seasonal monsoon in Terengganu Coast**
  - 7) **Assessment of Shoreline Evolution for Kuala Nerus Terengganu coast, Malaysia, using the Digital Shoreline Analysis System Technique**
  - 8) **Shoreline Evolution as A Response to Hard Structure Protection at West and East Coast Peninsular Malaysia**
  - 9) **Mitigation tool for erosion management in Malaysia: A review**
  - 10) **Sustainable Natural Architectural Design for Sand Dune Restoration as Coastal Protection at the Beach that Prone to Seasonal Storms**
  - 11) **Analytical and Numerical Study of Wave Resonance Phenomena in a Basin with Absorbing Wall and Submerged Breakwater**
  - 12) **Wave Shoaling Phenomenon Modelling using Physics Informed Neural Networks (PINNs)**
  - 13) **Mangrove Forest for Climate Change Mitigation**
  - 14) **Validation of abnormal sea surface temperature under coastal upwelling in South Korea with SCHISM-WRF**
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**Sessions : Marine Environment and Management 17**

- 1) **The Environmental and Economic Assessment of using Liquefied Natural Gas as a Fuel Onboard Bulk Carrier Ships**
  - 2) **Contemporary Anthropogenic Challenges Threatening the Indian Ocean Area of Africa: Mitigation and Adaptation**
  - 3) **Evaluation Compliance on Annex V MARPOL 73/78 Guidelines among Cargo and Passenger Vessels: A case of Philippines' Sea ports**
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  - 12) **Taxonomy of Brachyuran Crabs from Andaman and Nicobar Islands, Bay of Bengal, India**
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**Sessions : Navigation, Maritime Logistics and Management 31**

- 1) **An integrated intermodal freight transportation system to avoid container supply chain disruptions in Chittagong port of Bangladesh**
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- 8) **Short Term Impact of Seascout Accident: A Spatio-Temporal Case Study for Al Duqm Sea Area, Oman**

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- 9) **The redesign canvas: Conventional logistic into Halal logistic business model canvas (HLBMC)**
- 10) **India's Double Fish Hook Strategy - Technological and Logistical Aspects**
- 11) **The Promotional Measures for the Thai Merchant Fleet**
- 12) **A freight transport model to improve multimodal and intermodal freight transport services to the BIMSTEC member countries by centering Chattogram Port**
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### **Sessions : Marine Engineering and Management**

**45**

- 1) **Teaching Marine Engineering Terms Through On-Line Methods Within the Framework of Training Courses**
  - 2) **Modelling and Analysis of the Voyage Cycle for Ferryboat Electrification**
  - 3) **Re-Creating 3D Ship Geometries as Maps for Inspection and Reporting**
  - 4) **An Experimental Demonstration of the Methodology for the Simple Assessment of the Safety of Stability of a Training Ship Stability in Real-Time using Roll-Period**
  - 5) **Comparison of USV thruster configurations**
  - 6) **Study on the remelting process of Al-Si alloy refined with Al-Ti-B master alloy**
  - 7) **The microstructural improvement of Al-Si alloy using Al-Er master alloy**
  - 8) **The microstructure and hardness property alternation of a tool steel using the sub-zero treatment**
  - 9) **Marine Digital Twins for Smart and Autonomous Vessel Navigation**
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## *Keynote Speakers*

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# **The path towards a sustainable future at Hutchison ports Thailand**

Mr. Stephen Ashworth

Managing Director – Thailand & South East Asia, Hutchison Ports



## **Biography**

Mr. Ashworth was appointed Managing Director of Hutchison Ports Thailand (HPT) in January 2015. He also oversees the Hutchison Ports Group's port operations in South East Asia. Prior to his current position, Mr. Ashworth was Chief Executive Officer of Hutchison Ports Indonesia between 2010 and 2014. Mr. Ashworth previously worked for CK Hutchison Holdings Limited and Hutchison Ports between 1992 and 2001 in various finance and management positions.

Between 2002 and 2010, Stephen was Asia Pacific Chief Financial Officer for the Constituency Management Group (CMG), the marketing communications division of the US-listed Interpublic Group. During his time with CMG, Mr. Ashworth had overall responsibility for CMG's finance function in the Asia Pacific region.

He is a member of the Institute of Chartered Accountants in England and Wales and the Hong Kong Institute of Certified Public Accountants

# **Future fuels for decarbonizing shipping**

Prof. Dr. Volker Bertram

Senior project manager, DNV GL, Hamburg, Germany



## **Biography**

Volker Bertram (DNV) has worked half his professional life in academia and half in industry, largely involved with ship hydrodynamics and advanced IT applications. He runs his own conference series on technologies for future ships and shipping.



# **Towards sustainable coastal management from Malaysia perspective**

Assoc. Prof. Effi Helmy Ariffin

Marine Geoscience Program, Universiti Malaysia Terengganu (UMT), Malaysia



## **Biography**

Dr. Effi Helmy is Associate Professor of Marine Geoscience Program at the Faculty of Marine Science and Environment, Universiti Malaysia Terengganu and also as Deputy Director of Institute of Oceanography and Environment, Universiti Malaysia Terengganu (UMT). He obtained his M.Sc. in Oceanography (Oceanography Geology) in 2012 from UMT and completed his Ph.D. at Université Bretagne Sud, France in 2017.

His current research interest is focusing on the coastal morphodynamic within diverse coastal management strategies. This field of research required detail understanding of coastal processes due to natural hazard and anthropogenic factor. Conducting this research in the field are cumbersome due to many uncontrol variable in the surrounding especially in developed beaches. These supportive experimental methods such as numerical modeling provide the keys to a greater understanding on the pattern of monsoon that can influence the coastal processes. These approaches can discover the climate changes especially sea level rise and to apply the results of the experiment in coastal erosion as the main global problem. His other research interest includes exploratory study on natural protection at the beach in the monsoon environment, one of the new innovations and the first in Malaysia.

# **Innovative coastal protection solutions for sustainable management of erosion**

Prof. Subramaniam Neelamani

Senior Research Scientist, Kuwait Institute for Scientific Research, Kuwait



## **Biography**

Dr. S. Neelamani is a Senior Research Scientist, Coastal Management Program, Kuwait Institute for Scientific Research, Kuwait. He got Ph.D. from IIT Madras in 1990 and was teaching in the Department of Ocean Engineering, IIT Madras from 1990 to 2003. He was also the NCC officer and Sports advisor at IITM. He was the recipient of the Alexander von Humboldt Post-Doctoral Research Fellowship, Germany during 1996 to 1998. He has more than 350 scientific papers in the reputed international and National Journals and conferences. He has coordinated 60 research projects, 60 consultancy projects and 40 scientific training programs in the area of coastal engineering. His specialization is Physical modeling on Ocean structures, Ocean Energy and marine environmental issues. He was bestowed with the Scientific Achievement Award by Kuwait Institute for Scientific Research for 5 times since 2009 for his distinguished scientific contribution and achievements. He was also awarded the “Engineer of the year” by Tamilnadu Engineers Forum, Kuwait during 2016 and “Life Time Achievement Award” in the area of coastal engineering by Venus International Research Foundation, Chennai, India during 2016. He holds three US patents as lead inventor and many recognitions from around the world for these inventions. These US patents won Gold and Silver medals in the international innovation exhibitions worldwide. He is the lead author for the book titled “Extreme Wind Atlas for Kuwait” and is widely used by construction companies in Kuwait. His hobby is guidance and counseling of school children to excel in life.

## *Oral Presentations*

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## **Sessions : Coastal Engineering and Management**

**Date - Time : Tuesday 28 February 2023 – 1.00 – 5.40 p.m.**

**Venue : *Space 5***

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- 1) The Heritage Impact Study Assessment (HIA) in the Sustainable Development of the Coast of Melaka**
- 2) Coastal Vulnerability Assessment for Future Sea level Rise-Experiences and Case Studies from Kuwait**
- 3) Nature based solution for coastal erosion protection in changing climate: contexts and prospects**
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- 12) Wave Shoaling Phenomenon Modelling using Physics Informed Neural Networks (PINNs)**
- 13) Mangrove Forest for Climate Change Mitigation**
- 14) Validation of abnormal sea surface temperature under coastal upwelling in South Korea with SCHISM-WRF**



## The Heritage Impact Study Assessment (HIA) in the Sustainable Development of the Coast of Melaka

Asyaari Muhamad<sup>1,\*</sup>, Amir Husaini<sup>1</sup> and Yasmin Amirah<sup>1</sup>

<sup>1</sup> *Institute of The Malay World and Civilization (ATMA), The National University of Malaysia, 43600 Bangi, Selangor*

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### Keywords

Coastal development  
Heritage impact  
assessment  
Maritime archaeology  
Sustainable development  
plan

### Abstract

Through the strategic plan of Melakaku Maju Jaya 2035 (PSMJ 2035), the State of Melaka has implemented several modern development policies aimed at triggering the economy and increasing the state's revenue. One of the aspects applied is the question of land development in Melaka through the introduction of the Melaka-Waterfront Economic Zone (M-WEZ) project. This development project involves the development of an area of 10,117 hectares along the coast of Central Melaka. However, the results of this development planning have directly triggered a polemic among state policy planners and the National Heritage Department since this development involves several very sensitive issues. Among the issues that are often raised is the preservation and conservation of the heritage and history of the state of Melaka. Therefore, the writing of this article will describe the role and process of Heritage Impact Assessment (HIA) as a conflict-solving tool in assessing the implications, as well as provide recommendations and mitigation measures that need to be implemented in any area to be developed, especially in the aspect of maritime HIA study to enable both the sustainable development and maintenance of the historical heritage of the state of Melaka to move in line.

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## Coastal Vulnerability Assessment for Future Sea level Rise-Experiences and Case Studies from Kuwait

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Keywords	Abstract
Coastal Vulnerability Sealevel Rise Inundation Erosion Economic loss	The accelerating acute climate change effect and faster melting of ice from polar and other regions has hastened the Sea level rise (SLR). From the literature, one can find different orders of SLR prediction for the year 2100, which depends on the emission path the world will follow, which has high degree of uncertainty. DeConto and Pollard (2016) predicts that if nothing is done, SLR would be more than a metre by 2100 and by 15 metres over the next 500 years. Under this situation, all the coastal countries around the world need to assess the possible coastal vulnerability (CV) due to SLR. The main vulnerabilities are physical, erosion, inundation, sea water intrusion and socioeconomic damages. Hundreds of publications are available on the CV assessments. The best-practice is yet to come on this topic. The governments of these countries will leap into action to reduce the CV, if it assessment helps to reveal the economic loss such as land loss due to permanent inundation, loss due to future erosion etc. It is required to know the critical environmental parameters and its weightages on the assessment of each vulnerability. For example, wave height is the most important parameter for erosion when compared to seabed slope and soil particle size. Kuwait has worked on assessing the CV during the past 5 years. The experiences and the typical vulnerability information will be revealed in this paper.

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## Nature based solution for coastal erosion protection in changing climate: contexts and prospects

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Keywords	Abstract
Coastal erosion Coastal protection Nature-based solutions Climate change Muddy coast	Coastal erosion in the changing climate situation is a grievous concern. Global experience varies in this regard due to the variation of the coastal dynamics. To better understand people's continuous struggle with coastal erosion and protection techniques, this paper aims at looking into the global contexts and experiences of nature-based solutions (NbS) for coastal protection to assess how NbS has been playing crucial role in coastal erosion protection, biodiversity protection and renewing natural habitats and thus playing critical role to shield coastal population in a changing climate situation. Systematic method has been utilized for this research that explores the global to regional landscape of NbS in coastal erosion, policy framework and the national experience. For a country like Thailand, it has a long history of combating coastal erosion for both the country's muddy and sandy coast. Experience from the upper Gulf of Thailand has to be critically understood for the prospects and pivotal future pathway of sustainable coastal erosion protection and climate resilient development.

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## Mathematical model development project to support building design and construction Navy coastal buildings

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Keywords	Abstract
Civil engineering Geo-informatics Remote sensing technology Global Positioning System Information technology virtual model Mathematical model	<p>The objective of this research was to collect necessary coastal data in Amphoe Sattahip, Chonburi Province, and Amphoe Muang Phuket Province, and use it to develop a mathematical model to support building design of Navy coastal buildings in accordance with their physical characteristics. The results of the research were 4 models (2 models in each study area), namely the mathematical models for wave height, and coastal changes. Sattahip Bay Area, Amphoe Sattahip, Chonburi Province, The Wave height mathematical model can predict the height and direction of the waves in the Sattahip Bay area in case both before and after construction of buildings according to the conditions of the wave direction and the wave height given and mathematical models of coastal changes are consistent with real terrain. Based on the mathematical model analysis of coastal changes at Dongtan Bay, Royal Thai Fleet Pier, the deposition and erosion zones can be divided into 3 zones, namely Zone 1, Dong Tan Bay, east of Royal Thai Fleet pier, the highest erosion rate was 33.02 meters, the lowest erosion rate was 2.96 meters, Zone 2, west side of Royal Thai Fleet pier, an overlay rate was 17.04 meters, the lowest deposition rate was 12.22 meters. Zone 3, Royal Thai Fleet pier area, an overlay rate was 3 meters, an erosion rate was 3 meters. Third Naval Area Command, Ao Yon, Amphoe Muang, Phuket Province. The Wave height mathematical model, Mueang District, Phuket Province can predict the height and direction of waves in Ao Yon area both before and after construction of buildings according to the conditions of the wave direction and the wave height given and mathematical models of coastal changes is consistent with the real terrain. Based on the mathematical model analysis of coastal changes at Ao Yon, Third Naval Area Command, It was found that the beach area of Third Naval Area Command had an average erosion rate from 2016 to 2020 was - 0.38 m. Mathematical model development project to</p>



support building design and construction Navy coastal buildings makes we know the height and direction of the waves and changes in the coastline in areas where buildings are being built jutting out into the sea. It can be used to develop a model to be a long-term management system and is useful in forecasting wave heights and change the coastline in the future that will help to support the design and construction of the Navy's coastal buildings and management of coastal areas as well

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## Coastline changes along the east coast of Thailand and Peninsular Malaysia

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Keywords	Abstract
Coastal evolution EPR DSAS Erosion Accretion	East coast of Thailand and Peninsular Malaysia, is under an unceasing threat of coastal erosion caused by both natural and anthropogenic activities. Alterations on the coastline position have resulted in degraded agricultural and aquaculture land, increased tidal floodplain areas, and subsequently impacted the livelihood of the coastal communities under dynamic climatic scenarios (e.g., monsoon, typhoon, cyclones). The current study focused on the historical coastline analysis in order to quantify coastline variations using the satellite data and the Digital Shoreline Analysis System (DSAS 5.1) integrated with ArcGIS software. The statistical parameters End Point Rate (EPR) were used to estimate the coastline change rate based on evolutionary trends across 15 years covering two periods (2004-2010 and 2010-2019) due to series of coastal defence construction. The analysis of results revealed that the erosion of the coastline in east coast of Thailand and Peninsular Malaysia was dominant over the accretion, with a rate of more than 1.5 m/year, indicating an alarming level of erosion. It is anticipated that the findings of this study will aid in understanding the potential risks of future changes in the coastline, which will necessitate the related country for developing planning and management strategies. As a result, coastal managers are able to implement sustainable management strategies as early as possible to preserve and restore the natural coastal habitats (e.g., beaches, mangroves) that are susceptible to prolonged erosion.

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## Beach morphodynamics influences from seasonal monsoon in Terengganu Coast

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Keywords	Abstract
Beach Erosion Beach Recovery Beach Profile Numerical Modelling Littoral Current	Globally the beach processes reveal the erosion and accretion process during storm and calm season respectively. These natural processes can be reflected during monsoonal as natural influence factors. For instance, in Kuala Terengganu coastline shows fluctuation in beach recovery due to the influence of wind, wave and tidal effects. On the other hand, the difference on beach morphodynamic by anthropogenic activities can reveal the difference pattern on sand recovery. As results, the Batu Buruk beach undergoes natural processes which alters the beach morphology significantly. Several analyses of beach morphodynamic had been conducted throughout the course such as beach profile survey, beach volume analysis and supported by numerical modelling of three phases on seasonal monsoon (transition monsoon, northeast monsoon and southwest monsoon). The sediment transport was transported to southward of Kuala Terengganu coast. The beach recovery occurs after during northeast monsoon to southwest monsoon. This also supported by physical data which presenting the intensity of wind and wave become decrease due to southwest monsoon. The occurrence of tidal force on beach dune to the land shown decreasing of over wash of wave at beach dune area. Hence, this study could provide an insight of natural sediment transport which alter the beach morphology on different seasonal monsoon.

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## Assessment of Shoreline Evolution for Kuala Nerus Terengganu coast, Malaysia, using the Digital Shoreline Analysis System Technique

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Keywords	Abstract
Shoreline Evolution Coastal Erosion Aerial Photograph DSAS	<p>Kuala Nerus Terengganu beaches are considered to be the primary tourism assets and major recreational sites for the local population. Nonetheless, coastal areas are also fragile and changeable due to natural and anthropogenic factors. The construction of the purported extension of the airport runway at Kuala Nerus Terengganu has exhibited high erosion owing to anthropogenic activities. The resulting evolution could have a significant impact on the coastal community. Thus, monitoring shoreline evolution for environmental protection in Kuala Nerus coastal area is an important task to address these issues. The objectives of this study are to analyze the pattern of shoreline evolution and provide a historic overview of Kuala Nerus Terengganu's coastal evolution. The coastal evolution was documented by a comparative analysis of aerial photographs for a period between 2006 to 2019 which indicate many series of coastal defence. The shoreline was analyzed by the rate of change of shoreline evolution with the final output of the End Point Rate value from the Digital Shoreline Analysis System. The shoreline evolution was categorized into three states: pre (2006-2010), during (2010-2012) and post-construction (2012-2017 &amp; 2017-2019) of the purported extension of the airport runway. Results revealed a significant erosion rate of <math>-107.55 \text{ m}^2</math> respectively at Tok Jembal after the construction airport runway. Meanwhile, significant accretion occurred at Tok Jembal and Pengkalan Maras after the implementation of the coastal structure. Therefore, the value and information can be utilized for appropriate enforcement of coastal management policies to preserve socio-economic activities and can preserve the coastal community.</p>
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## Shoreline Evolution as A Response to Hard Structure Protection at West and East Coast Peninsular Malaysia

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Keywords	Abstract
Erosion Control Monsoon Beach Morphology Coastal Process	Malaysia has implemented protection measures and shoreline management to raise erosion issues for the past 30 years. Intense related physical phenomena contributed to the erosion factors from seasonal monsoons and the geomorphology of the shoreline. Meanwhile, poorly planned site development activities, poor selection of mitigation techniques or the result of the construction at adjacent shorelines also contribute to erosion issues in Malaysia. This study assessed the temporal and spatial beach morphodynamic pattern at the hard structure-protected shoreline. The area of interest covers the shoreline of Selangor and Kelantan, located on the west and east coast of Peninsular Malaysia, respectively. The beach morphology was acquired by total station by collecting cross-section profiles of the beach. Meanwhile, the Digital Shoreline Analysis System (DSAS) monitored the annual shoreline changes. The result shows the beach morphology and shoreline change rates in Kelantan are majority towards negative impact while the Selangor shows a majority towards positive impact. The beach morphodynamics of both Selangor and Kelantan gives a different response to the seasonal monsoon. The findings help understand and bridge the knowledge of the coastal morphodynamics at the coastal structure protected region in different environment settings. It is also significant in assisting the erosion control strategies for wave energy and tide-force driven coastal.

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## Mitigation tool for erosion management in Malaysia: A review

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Keywords	Abstract
Mitigation tool Erosion management Stakeholder Framework	The assessment of a particular mitigation tool is crucial for the prediction of future risks, to support policymaking and long-term action plans measures which can be applied at both domestic and global levels. The long-term strategy aims to control the erosion issues in the eroded areas while reducing its negative impacts through non-structural measure. In addition, there are increasing incidents related to erosion which called for an integrated approach in the sense of management. The most well-known mitigation tool introduced by Malaysia's government was Integrated Shoreline Management Plan (ISMP) which has been carried out by Department of Irrigation and Drainage (DID) and tailored along the principles of Integrated Coastal Zone Management (ICZM). This review highlights the most common mitigation plan for erosion management in Malaysia.

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## Sustainable Natural Architectural Design for Sand Dune Restoration as Coastal Protection at the Beach that Prone to Seasonal Storms

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Keywords	Abstract
Sand trap Dunes restoration Beach profile Sediment transport	<p>Monsoonal storm causes coastal erosion of worldwide sandy beaches in the absence of sand dunes including Terengganu coast, Malaysia. Practically, hard structure of coastal defences such as revetment approaches are effective to mitigate erosion but not change the erosion causes and led secondary impact on the coast. Therefore, one of the alternative sustainable coastal defences is using sand trapping that made up of wooden blocks solely to protect beach erosion as we called E- Fences. E-Fence has proven to be effective in reducing the impact of erosion by encouraging sediment accumulation behind the E-Fence. E- Fence has been implemented in a zigzag pattern parallel to the shoreline within the Highest Astronomical Tide (HAT) and Mean Higher High Water (MHHW) water level at Batu Rakit and Ma' Daerah, Terengganu coast. Effectiveness of the E-Fence will be determined using a real-time kinematic (RTK) global positioning system (GPS) and an anemometer. The in-situ profile of beach volume supported by beach slope utilizing Profiler-XL 3.2 software will reveal dunes restoration. Descending wind speed from the swash zone to the backshore will indicate energy reduction that leads to sediment deposition through the gaps of E-Fence that transported by wave or wind. Those result will be used for XBeach simulation to observe sediment accumulation with E-Fence protection. The installation is environment-friendly, affordable, and easy construction. E-Fences is suggested to be used as coastal defence as it prioritizes dunes restoration. The innovation's hope is to assist authorities in developing cheaper erosion mitigation for coastal erosion in Malaysia.</p>

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# Analytical and Numerical Study of Wave Resonance Phenomena in a Basin with Absorbing Wall and Submerged Breakwater

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Keywords	Abstract
Wave resonance Resonant period Shallow water equation Finite volume method	The phenomenon of resonance in a basin can seriously harm the environment. The main factor influencing the resonance event is the basin's natural period. If an external force enters the basin with similar period to the basin's natural period, a resonance phenomenon will occur. The way to overcome the occurrence of resonance events is to utilize the absorbing walls and the breakwaters. In this study, we will use the shallow water equations as the governing equations for the basin with an absorbing wall and one block rectangular submerged breakwater. Moreover, analytical and numerical solutions to the governing equations will be used to examine the natural period of the basin. Furthermore, we will carry out some numerical simulations based on the finite volume method to recognize the presence of the resonance phenomenon. In addition, we will also examine the minimum value of friction coefficient of the breakwater and the absorbing wall in order to mitigate the resonance event from occurring.

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## Wave Shoaling Phenomenon Modelling using Physics Informed Neural Networks (PINNs)

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Keywords	Abstract
Shallow water equations Wave shoaling Neural Network PINN	The phenomenon known as "wave shoaling" occurs when the water wave amplitude increases as the water depth decreases. This phenomenon frequently occurs on beaches as a wave of water approaches the shore. Although this phenomenon can be simulated using a number of classical numerical methods, doing so can be very computationally expensive. In place of the limitations imposed by any classical method, PINNs, or Physics Informed Neural Networks, can be used to approximate PDEs. In order to examine how well PINNs can capture the shoaling phenomenon, PINNs will be used in this paper to approximate the shallow water equation. The PINN model is implemented using PyTorch with a variety of different parameters and neural network architecture. Several approximations using the traditional numerical method are offered for comparison.

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## Mangrove Forest for Climate Change Mitigation

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### Keywords

Mangrove  
Shallow Water Equation  
Allometric Equation  
*Rhizophora apiculata*

### Abstract

Coastal protection is critical for managing shoreline issues caused by the coast's continuous population growth. Coastal wetland ecosystems, such as mangrove forests, have been recognized for their ability to stabilize shorelines and protect coastal communities. Mangroves' high ability to store carbon, in addition to providing significant coastal protection, is currently receiving a lot of attention in the context of climate change. In this study, we're interested to investigate the wave-damping phenomenon caused by mangroves, in general, using a modification of linear Shallow Water Equations. The model will be solved analytically using the separation of variables approach to obtain the wave transmission coefficient. Furthermore, the model is numerically solved using a finite volume on a staggered grid. We discovered that comparing the analytical and numerical results yielded similar results, implying that the numerical scheme can closely approximate the analytical solution. In addition to that, an allometric equation will be used to estimate the aboveground biomass of different mangrove species. Later, biomass estimates for mangroves can subsequently be converted to estimates of above-ground carbon using a standard multiplier. According to the simulation conducted in this study, the wave reduction is amplified as the friction coefficient and mangrove length increase. Meanwhile, among the different mangrove species, *Rhizophora apiculata* was found to store relatively more above-ground biomass and carbon. This suggested that *R. apiculata* can be one of the species to prioritize in mangroves preservation to mitigate climate change because it has a generally higher DBH value, thus requiring fewer trees than the other two species to produce biomass and carbon stock from the same width of mangrove area.

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## Validation of abnormal sea surface temperature under coastal upwelling in South Korea with SCHISM-WRF

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Keywords	Abstract
Coastal Upwelling SCHISM-WRF Numerical Simulation Sea Surface Temperature	Coastal upwelling is the process by which seasonally low sea surface temperature (SST) is occurred from the response of the coastal ocean to alongshore winds, leading to the production of a relatively intense current (Pedlosky, 1978). The low SST could affect the habitat environment of various fishes and it could damage the fishery industry (Gangwon Research Institute, 2017). So, the understanding and prediction of coastal upwelling is needed to protect the fishery disaster. In this study, the air-sea coupled model SCHISM-WRF was used to understand the abnormal sea surface temperature under coastal upwelling. The study area was Korea offshore (latitude: 32°N – 39°N, longitude: 124°E – 132°E) and the observation data of SST measured by NIFS (National Institute of Fisheries Science) was compared with SCHISM-WRF simulation results. As a results of SCHISM-WRF simulation, the coastal upwelling occurred along the East Sea of South Korea due to southwest wind, resulting in the formation of a cold-water belt. And the location of cold-water belt from SCHISM-WRF result was like the observation data. From these results it was considered that SCHISM-WRF was the appropriate for predicting the abnormal SST and the depth of topography and wind stress were the important variables to occur the cold-water belt in Korea. If the data assimilation is applied to SCHISM-WRF in the future, it will be possible to apply in practice about predicting the abnormal SST and to establish the countermeasures for damage reduction in the fishery industry.

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## **Sessions : Marine Environment and Management**

**Date - Time : Tuesday 28 February 2023 – 1.00 – 5.00 p.m.**

**Venue : *Space 6***

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- 1) The Environmental and Economic Assessment of using Liquefied Natural Gas as a Fuel Onboard Bulk Carrier Ships**
- 2) Contemporary Anthropogenic Challenges Threatening the Indian Ocean Area of Africa: Mitigation and Adaptation**
- 3) Evaluation Compliance on Annex V MARPOL 73/78 Guidelines among Cargo and Passenger Vessels: A case of Philippines' Sea ports**
- 4) The SEEMP Slow Steaming Performance in Reaching out the Carbon Intensity Indicator**
- 5) Qualitative analysis of Microplastics impact in Mangroves and their surrounding in Kovalam Fishing village, east coast of India**
- 6) Marine Pollution: Impact on Ships and Infrastructure on Karachi Harbor**
- 7) Environmental Forensic Analysis of the Shoreline Microplastics Debris on the Limbe Coastline, Cameroon**
- 8) Blue economy challenges and the different solutions to face these challenges**
- 9) Microplastics Contamination in Marine Fishes of Kapas Island, Terengganu, Malaysia**
- 10) Microplastics Contamination in Malaysian Elasmobranchs during Early Ontogeny**
- 11) The path to zero carbon shipping**
- 12) Taxonomy of Brachyuran Crabs from Andaman and Nicobar Islands, Bay of Bengal, India**



## The Environmental and Economic Assessment of using Liquefied Natural Gas as a Fuel Onboard Bulk Carrier Ships

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### Keywords

Air emissions reduction  
Environmental and economic benefits  
Dual fuel engine  
IMO  
Natural gas  
Ship emissions

### Abstract

As International Maritime Organization emission regulations become more rigorous, the marine industry is submitting to transformation to green shipping. Clean air and human beings health concerns during this pandemic (COVID-19) gained renovated interest and continues to be a key determinant of renewable port activity. The alternative fuels' debate has been dominated by the potential of liquefied natural gas. LNG-fuelled vessels count to approximately 13% of the running new build order book and estimates for 2021 and demonstrates continue growth in many classifications of society of vessels. This paper studies the environmental and economic assessment of using liquefied natural gas liquefied natural gas as a fuel onboard bulk carrier ships. Environmentally, the research reveals that there is a possibility of achieve a reduction of air pollutant emissions, of nitrogen oxides, sulfur oxides, particulate matter and carbon dioxide by 80.7%, 98.5%, 97.6% and 21.8%, respectively, at annual saving damage due to atmospheric emissions per year of 2.27, 11.97, 0.82 and 0.18 million dollars, respectively. Moreover, it is predicted that an annual fuel saving cost of 2.5 million US dollar, compared to heavy-fuel oil for marine shipping could be achieved.

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## Contemporary Anthropogenic Challenges Threatening the Indian Ocean Area of Africa: Mitigation and Adaptation

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Keywords	Abstract
Ocean Fishing Africa Coast Space	<p>This Sahel environment stretches all the way from Senegal to Somalia cutting across over ten Africa countries bordering the " Sahara desert" in the north and the "Sudan savannah" in the south, with an annual rainfall of less than 50cm per annum, with good agricultural output (production) as well as large grazing fields for pastoral activities is a home for so many indigenous communities like the Mbororo (Cameroon and Chad), Tuareg (Niger) and the Kanuris (Nigeria, Niger, Chad and Cameroon) who depend on pastoral activities, fishing, irrigation farming and mineral extraction as their main activities of livelihoods. Desertification is a primary issue faced by these Sahelian communities; the indigenous communities are continuously losing their grazing fields, farmlands, and even villages to the encroaching "Sahara Desert" from the north. Indigenous communities in the Sahelian region are currently trying their best in control of the desert encroachment through tree-planting campaigns, small or local forestation projects and other programmes using traditional knowledge on their own, but yet the desert keeps expanding invading grazing fields, farms and even villages and towns. However, the UN does not currently recognize their contributions and does not include their participation in its desertification activities in the region. Loss of biodiversity, hunger, poverty and social insecurity are becoming the order of the day hence making Food security to be under threat from this because of losses in agricultural output as well as increases on job losses and unemployment. It was also reported that the villages of Kaska, Buhari gana and Bukarti in the Sahel part of the Northeastern Nigeria were completely wiped out or buried under the desert between the years 1987- 2005 as well as continuous appearances of new sand dunes in the fertile areas of this Sahel region from time to time and in various areas (B. Abubakar). Some scientists have recently conducted research works, concluded and reported that the desert keeps expanding at present at the rate of 0.8 Kilometres per Annum (B. Abdullah, 2009). B. Abubakar 2009 also reported that some part of the Sahel would be rendered uninhabitable in the next ten years and because the region provides about 40% of the protein requirements of the sub Saharan African region as a whole in the form of Beef, Fish, Beans, vegetables, Lamb and others if this desertification issue is not brought under control it will lead to continued hunger, famine, under nutrition, outbreak of diseases and even wars and social conflicts.</p>

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## Evaluation Compliance on Annex V MARPOL 73/78 Guidelines among Cargo and Passenger Vessels: A case of Philippines' Sea ports

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Keywords	Abstract
MarPol 73/78 Management Plan ANNEX V MARPOL 73/78	<p>The 1973 MARPOL (Marine Pollution) Convention as modified by the Protocol of 1978 (MARPOL 73/78) aimed to eliminate and reduce the volume of garbage being thrown into the sea to protect it from further damage. This study aimed to evaluate the compliance with Annex V of MARPOL 73/78 guidelines among cargo and passenger vessels at the ports of San Jose in the Province of Antique and Caticlan in the province of Aklan both in the Philippines. Specifically, this study aimed to evaluate overall compliance to garbage management under Annex V of MARPOL 73/78. This descriptive study utilized a guided-questionnaire checklist composed three parts. The respondents of the study were the officers and crews of six cargo and three passenger vessels available at the ports of San Jose, Antique and Caticlan, Aklan, Philippines for the entire month of October 2011. Data collected were processed, analyzed and interpreted. Results of the study showed the following: 1) Garbage generated among the two types of vessels surveyed included the following: a) bottles, b) cans, c) crockery, d) floating dunnage, e) food waste, f) glass, g) lining and packing materials, h) metals, i) paper, j) plastics, k) rags, l) sewage, m) waste oils; 2) There was a 100% compliance with posting of placards on Garbage Management Plan among passenger vessels but only four cargo vessels (67.7%) were compliant; 3) All passenger vessels had color coded receptacles for segregation of collected waste on-board while only three (50%) cargo vessels had color coded receptacles; 4) The volume of garbage by passenger vessels were much greater than those generated by cargo vessels at 6 and 0.22 m<sup>3</sup>, respectively, within a 15-day collection period; 5) In terms of the volume of waste oil generated, both cargo and passenger vessels produced the volume of approximately 467 liters but with differing generation time. Both cargo and passenger vessels surveyed in October 2011 were not compliant in terms of the quantification of generated garbage per requirement of MARPOL 73/78; and 6) Both vessel types collected and segregated their wastes on board but there were no collections at the ports studied. In conclusion, majority of vessels were compliant with specific requirements of Annex V of MARPOL 73/78 but cargo vessels need to enhance their compliance with these guidelines. More vessels and docking ports are recommended for evaluation for greater accuracy and validity of information generated in this first attempt to evaluate compliance with MARPOL 73/78 in the Philippines.</p>

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## The SEEMP Slow Steaming Performance in Reaching out the Carbon Intensity Indicator

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Keywords	Abstract
MARPOL SEEMP CII Slow Steaming Decarbonization	MARPOL Annex VI provides, regulates, and guides the method for addressing the air pollution issues in the maritime industry. The implementation of MARPOL Annex VI has recently been enhanced through the Ship Energy Efficiency Management Plan (SEEMP) as an operational measure and the Energy Efficiency Design Index as a design measure. Aside from the above, the IMO has also developed an intensifying rating to identify whether the effort made by the maritime industry bodies has met the IMO goal to cut the greenhouse gas (GHG) emissions from shipping activities by 40% in 2030 compared to the 2008 level. The Carbon Intensity Indicator (CII) rating has become a benchmark for investigating, preparing, issuing, and monitoring carbon reduction tools for shipping activities. Through the application of slow steaming during sea passage, the SEEMP has applied one of the most practical methods to reduce the carbon emissions of a vessel. Therefore, the question of how important the SEEMP Slow Steaming method is in achieving the required CII rating value arises. This study will try to simulate and analyze the selection based on the existing engine and slow steaming. It is expected to determine if the SEEMP slow steaming practical has a significant impact on the reduction of CII rating value.

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## Qualitative analysis of Microplastics impact in Mangroves and their surrounding in Kovalam Fishing village, east coast of India

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Keywords	Abstract
Mangroves NDVI CMRI Microplastics FTIR Sieve analysis and stakeholders	<p>Mangroves are located in coastal wetland in tropical and subtropical region. They act as nursery ground for many marine resources and act as a barrier to dissipate the wave energy. They are degraded more due to anthropogenic factors and recently microplastics impact in mangroves. Microplastics are type of polymers having size &lt; 5mm and has two types are, primary and secondary microplastics. Because of its less size can enter everywhere and cause harmful impacts. It needs attention towards protection and conservation of mangroves and to investigate the impacts of microplastics.</p> <p>The study area is Kovalam Fishing village with backwater mangroves along east coast of India. Here the mangroves are in predicament because of encroaching sky-scraped buildings and sewage disposed into backwaters. Urging imminent need to concern to protect fringing mangrove in this location. In this paper focus on two objectives 1. To identify mangrove species with NDVI and CMRI analysis using remote sensing and GIS. 2. To collect mangrove roots, backwaters and mangrove sediments for finding microplastics through laboratory analysis using FTIR, Sieve and microscopic investigation. From this investigation has confirmed that the mangrove roots having microplastics the size &lt; 1mm, backwater has all type of microplastics in their size from 1mm to 5mm and sediment also contaminated with number of visible fragmented plastics. From this investigation, has high microplastics contamination in the study area and need to protect this mangrove by proper sewage treatment, management, has to follow CRZ regulation for new buildings and to make awareness among stakeholders.</p>

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## Marine Pollution: Impact on Ships and Infrastructure on Karachi Harbor

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Keywords	Abstract
Karachi Harbor Pollution Infrastructure Environment	<p>Karachi harbor has an immense operational infrastructure of Pakistan National Shipping Corporation (PNSC), Pakistan Navy (PN), and Pakistan Maritime Security Agency (PMSA). It is significant for the readiness of PN and PMSA for peace and wartime operations. Although the Government of Pakistan has declared Karachi Port Complex a National Vulnerable Area, Karachi's coast receives massive pollutants from various land and sea sources. The primary sources include liquid discharge from industry and solid effluents of the municipality. The non-availability of disposal facilities and the absence of effluent treatment plants add to the misery. Toxic liquids and solid pollutants remain in the harbor for extended intervals. This pollution threatens the marine environment and ocean life and degrades water quality. These pollutants also affect the life of assets and infrastructures, including incoming and parked ships, which deteriorate fast. This paper includes the sources of pollution and the current state of Karachi harbor. Also, possible outcomes of the growing pollution fall into the domain of this study.</p>

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## Environmental Forensic Analysis of the Shoreline Microplastics Debris on the Limbe Coastline, Cameroon

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Keywords	Abstract
Forensic analysis Beach MPs Particle/number Polymer composition Cameroon	<p>The prevalence and unpleasant nature of plastics pollution constantly observed on beach shore on stormy events has prompted researchers worldwide to thesis on sustainable economic and environmental designs on plastics, especially in Cameroon, a major touristic destination in the Central Africa Region. The inconsistent protocols develop by researchers has added to this burden, thus the morphological nature of microplastic remediation is a call for concerns. The prime aim of the study is to morphologically identify, quantify and forensically understands the distribution of each plastics polymer composition. Duplicates of 2×2 m (4m<sup>2</sup>) quadrants were sampled in each beach/month over 8 months period across five purposive beaches along the Limbe – Idenau coastline, Cameroon. Collected plastic samples were thoroughly washed and separation done using a 2 mm sieve. Only particles of size, &lt; 2 mm, were considered and forward follow the microplastics laboratory analytical processes. Established step by step methodological procedures of particle filtration, organic matter digestion, density separation, particle extraction and polymer identification including microscope and 4X magnifier were applied for the beach microplastics samples. Microplastics were observed in each sample/beach/month with an overall abundance of 241 particles/number weighs 89.15 g in total and with a mean abundance of 2 particles/m<sup>2</sup> (0.69 g/m<sup>2</sup>) and 6 particles/month (2.0 g/m<sup>2</sup>). The accumulation of beach shoreline MPs rose dramatically towards decreasing size with film, fiber and microbeads only found in the &lt; 1 mm size fraction. Approximately 75% of beach MPs contamination were found in LDB 2, LDB 1 and IDN beaches/average particles/number while the most dominant polymer type frequently observed also were PP, PE, and PS in all morphologically parameters analysed. Beach MPs accumulation significantly varied temporally and spatially at <math>p = 0.05</math>. ANOVA and Spearman's rank correlation used shows linear relationships between the sizes categories considered in this study. In terms of</p>

polymer MPs analysis, the colour class recorded that white coloured MPs was dominant, 50 particles/number (22.25 g) with recorded abundance/number in PP (25), PE (15) and PS (5). The shape class also revealed that irregularly shaped MPs was dominant, 98 particles/number (30.5 g) with higher abundance/number in PP (39), PE (33), and PS (11). Similarly, MPs type class shows that fragmented MPs type was also dominant, 80 particles/number (25.25 g) with higher abundance/number in PP (30), PE (28) and PS (15). Equally, the sized class forward revealed that 1.5 – 1.99 mm sized ranged MPs had the highest abundance of 102 particles/number (51.77 g) with higher concentration observed in PP (47), PE (41), and PS (7) as well and finally, the weight class also show that 0.01 g weighs MPs was dominated by 98 particles/number (56.57 g) with varied numeric abundance seen in PP (49), PE (29) and PS (13). The forensic investigation of the pollution indicated that majority of the beach microplastic is sourced from the site/nearby area. The investigation could draw important conclusions regarding the pathways of pollution. The fragmented microplastic, a significant component in the sample, was found to be sourced from recreational activities and partly from fishing boat installations and repairs activities carried out close to the shore.

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# Blue economy challenges and the different solutions to face these challenges

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Keywords	Abstract
<b>Blue economy</b> COP27 Smart vessel	<p>The blue economy term means the economy of the water resources good management and the seas and oceans sustainable protection to be preserved for the present and future generations.</p> <p>The blue economy concept is created by Belgian economist Günther Pauli in the wake of the Rio+20 conference in 2012, based on the premise that healthy ocean ecosystems are more productive and are obligated to sustain ocean-based economies. The concept emphasizes the sustainable water resources management importance, based on the premise that healthy ocean ecosystems are the most productive and are essential for the sustainability of ocean-based economies. There are too many important fields are related to the blue economy such as the maritime field of its large-scale related areas of the marine engineering, naval architecture and the deck, fishing, tourism, and environment which all are directly and indirectly related with the different sustainability goals. To study the blue economy challenges, we have to study its relationship with the climate change and to go through the COP27 and its outcomes. In this paper I will analyse the different challenges that are faced by different countries according to its geographical area or its activity or culture and how these countries are facing these challenges by using the existing rules, conventions, or country nature and how the researchers are investigating to find a better solution to preserve the water sources and manage it by the best way.</p>

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## Microplastics Contamination in Marine Fishes of Kapas Island, Terengganu, Malaysia

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Keywords	Abstract
Microplastics Aquatic Pollution Marine Fish Malaysia Island	Microplastics (MP) contamination has been reported across marine environments over recent years, but MP pollution in coastal islands was less emphasized. This study aims to investigate the MP contamination in marine fishes of Kapas Island, Terengganu, Malaysia. A significant amount of MPs ( $p < 0.05$ ) were found in the entire samples of 90 analysed fish from 23 species with a total of 4730 particles. Overall, 79.6% of the MP particles found were fiber as compared to fragments (19.2%), films (1.1%), and foams (0.1%). Black constituted the most MP (32.6%), followed by white (25.5%) and blue (15.8%). The majority of the MP was found in the smallest size class of 0.01-0.50 mm which explained the small size of fiber dominating the population. The findings from this study suggest contamination of MPs in marine fishes of Kapas Island with possible risks to the fish populations and human health.

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## Microplastics Contamination in Malaysian Elasmobranchs during Early Ontogeny

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Keywords	Abstract
Microplastic Aquatic Pollution Embryo Elasmobranch Malaysia	Over the recent decades, microplastics (MP) with less than 5 mm in size have been reported contaminating marine environment all over the world. However, microplastic pollution in marine organisms, let alone elasmobranchs, is still understudied in Malaysia. Hence, this study aims to determine the MP contamination in elasmobranchs during early ontogeny from Malaysia. A total of 6 species of elasmobranchs ( <i>Scoliodon laticaudus</i> , <i>Carcharhinus melanopterus</i> , <i>Chiloscyllium hasseltii</i> , <i>Atelomyxerus marmoratus</i> , <i>Neotrygon kuhlii</i> and <i>Himantura imbricata</i> ) were investigated for the presence of MP. In overall, a total of 992 MP particles were found in the entire 54 individual samples analysed. Moreover, black and fiber type of MP were the most abundant observed. The majority of the extracted MP ranged in size from 0.01 to 1.00 mm, explaining the relatively small size of MP documented across all samples.
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# The path to zero carbon shipping

**Dr. Martin Kroeger, LL.M**

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Keywords	Abstract
Decarbonisation CO2-Regulation Transition	<p>The internationally agreed goal to limit global warming to well below 2°C compared to pre-industrial levels requires a climate-neutral world by the middle of this century. Transitioning global shipping from a carbon dependent industry into one that operates without greenhouse gas emissions is a massive task. It will be a complex multi-technology, multi-stakeholder development process that needs to be driven and supported by a range of mutually reinforcing global regulations.</p> <p>The shipping sector will experience a new technological revolution – as previous from wind to coal and then from coal and steam to fossil fuel combustion – that will need to meet maturity in less than three decades. This necessitates a complete transformation of the current dominant technology and a major scaling up of finance for technology development in addition to regulatory policies and effective public-private alliances. Shipping is already investing in the development of zero carbon technologies and fuels. But to make these investments, to take the necessary risks, all maritime actors need a regulatory framework that addresses the key strategic issues. This will need to include the following components:</p> <ul style="list-style-type: none"> <li>• A global price on carbon that effectively level the playing field among newer low and zero GHG ships and the tens of thousands of ships that will still be burning conventional fuels.</li> <li>• New build standards that support the energy transition, such as requiring ships.</li> <li>• Transparent well-to-wake life cycle analysis of fuels, combined with regulatory mechanisms to incentivize first-movers for use of alternative fuels.</li> <li>• Integrated development of global production and supply of zero GHG fuels through partnerships between states and energy providers.</li> <li>• Applied R&amp;D for shipboard and shoreside systems that allow the safe use of zero GHG fuels is necessary to put zero emission ships on the water.</li> <li>• An expanded international GHG Strategy including all these elements.</li> </ul>





## Taxonomy of Brachyuran Crabs from Andaman and Nicobar Islands, Bay of Bengal, India

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Keywords	Abstract
Andaman and Nicobar Islands Brachyuran Crabs <i>Eriphia sebana</i> SCUBA	<p>Studies on brachyuran fauna of Indian sea were initiated by Milne Edwards (1834) and Henderson (1882) mainly their effort was explore on deep sea species. Andaman and Nicobar Islands are well known rich corals and coral reef associated faunal diversity. Chopra (1930, 1931 and 1933) described two new species from the same region. Kumaralingam <i>et al.</i> (2010; 2015 a&amp;b) reported 30 species of brachyuran crabs newly recorded to Andaman as well as Indian context from these islands. The samples data were collected by SCUBA diving and hand picking method in the intertidal and sub-tidal zones during the studies period on 2011 to 2014. The collected crabs were preserved wet in 6-10% formalin for study purpose. The identification was confirmed based on photographs, and description and comparing them with the illustrative keys (Sethuramalingam and Ajmal Khan, 1991, Jeyabaskaran, et al., 2000). During the study period a total of 102 species belong to 22 families and 59 genera were recorded. The detailed taxonomic account of all the recorded species have been provided in this paper. The present study contributes 19 new occurrences of brachyuran crabs to Andaman and Nicobar Islands and India. Maximum number of families, genera and species were observed in North Andaman (72sp) while minimum at Nancowry groups (39sp). Among the presently recorded 102 species, only <i>Eriphia sebana</i>, <i>Thalamita admete</i>, were recorded from all the studies areas.</p>

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## **Sessions : Navigation, Maritime Logistics and Management**

**Date – Time : Tuesday 28 February 2023 – 1.00 – 5.20 p.m.**

**Venue : *Space 3***

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- 1) An integrated intermodal freight transportation system to avoid container supply chain disruptions in Chittagong port of Bangladesh**
- 2) The Sustainable Urban and Sea Logistics Planning in the Gulf of Thailand**
- 3) Semantic Arrangement of Navigational Safety Management**
- 4) Analysis of the river cruise network in Southeast Asia: A complex network approach**
- 5) Effective Digital Training Solutions to Support the Maritime**
- 6) Spatial-temporal Analysis of ship collision risk using Velocity Obstacle method: a case study in the estuarine waters of Yangtze River**
- 7) The capsizing risk assessment index for small fishing vessels**
- 8) Short Term Impact of Seascout Accident: A Spatio-Temporal Case Study for Al Duqm Sea Area, Oman**
- 9) The redesign canvas: Conventional logistic into Halal logistic business model canvas (HLBMC)**
- 10) India's Double Fish Hook Strategy - Technological and Logistical Aspects**
- 11) The Promotional Measures for the Thai Merchant Fleet**
- 12) A freight transport model to improve multimodal and intermodal freighttransport services to the BIMSTEC member countries by centering Chattogram Port**
- 13) Could untargeted cyberattacks against a vessel constitute a malicious act in thecontext of marine insurance?**



## An integrated intermodal freight transportation system to avoid container supply chain disruptions in Chittagong port of Bangladesh

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Keywords	Abstract
Freight Transportation Intermodal Hinterland Chittagong Port Lloyd's List Port Productivity	<p>An integrated intermodal freight transportation system is a derived demand to transport shipping containers from/to the seaport to/from hinterland instead of undertaking cargo loading and unloading activities in the port protected areas. The concept of the intermodal system is to transfer container to the nearby hinterland node such as dry port, inland rail, road, river terminal as a part of port development as well as increasing port efficiency and productivity. Greatly, Lloyd's List (2022) ranked Chittagong port as 64th busiest container port of the world as per container port throughput of 2021. The Chittagong port has a small scale intermodal facilities to off-docks/ICDs in the port city only. In addition, a pure intermodal system has developed by one rail ICD in the capital city Dhaka and two RICTs nearby Dhaka but less than 5% of port throughput. A large scale intermodal for serving to the major cities, SEZs, EPZs and industrial is absent due to planning and policy problems as well as unavailability of intermodal infrastructure and network. Due to improper hinterland intermodal chain, port faced container supply chain disruptions at port yard and exceeded port capacity that resulted in container vessel congestion at the outer anchorage of Chittagong port. By developing rail and road infrastructure and utilizing natural river connectivity, it is possible to develop road, rail and river intermodal system and shape an integrated intermodal freight transportation system to avoid container supply chain disruptions in Chittagong port. To develop an integrated intermodal system, this research choose quantitative research methodology for port throughput data analysis and sketched one intermodal model for Chittagong port. Overall, this paper aims to develop an integrated intermodal freight transportation system to support Chittagong port to keep and increase the record of port productivity, efficiency and competitiveness actively.</p>

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## The Sustainable Urban and Sea Logistics Planning in the Gulf of Thailand

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### Keywords

Urban logistics planning  
Sea planning  
Gulf of Thailand

### Abstract

Nowadays the world is facing with many natural disasters, earthquakes, droughts, floods, Tsunami even Typhoon and other sea disasters. Nothing can force against nature, however reduction of the impact occurred from disasters are what we expect. Since Thailand is one of the countries that has faced with disaster especially sea disaster because of its location lying upon Indian Ocean and Chinese Ocean. Hence, with the corporation of Humanitarian Assistance and Disaster Relief (HADR) and Southeast Asia Composition, Cloud, Climate Coupling Regional Study (SEAC4RS) from NASA, U.S.A., the Royal Thai Navy aims to study on location of Sea Rescue center. Form pilot study location the east coast of the Gulf of Thailand. Samui Island, Surat Thani Province is an appropriated place to set up the multipurpose facility for 3 major aspects; 1) Disaster relief of disasters effect. 2) Government Policy for Sea-Logistics Transportation. 3) Marine security to protect Thailand territorial water The research has started at this point with a question “when The Royal Thai Navy set up the station at Samui Island, Surat Thani Province for multipurpose facilities, what is a sustainable project planning which is suitable for Thailand?” The conclusion is that the suitable The Royal Thai Navy Station which a corporation from HADR and SEAC4RS could be considered under the roles of Thailand’s strategy in terms of: 1) Administration of the center 2) Inter-corporation 3) National Security 4) Logistics Management 5) Urban and Engineer Planning 6) Maritime Planning and 7) Port Planning. However, the lack of effectiveness plans and high technology, the sustainable plan seems to be cloudy. Therefore, the objective of this research is to find innovation know-how especially on Urban and Logistics planning using integrated concept between sea planning and urban logistics to plan a management station on Sea Disasters. This model may be a particular kind of urban logistics planning and expected to be a real importance.

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## Semantic Arrangement of Navigational Safety Management

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Keywords	Abstract
Navigation safety Navigation safety management terminological system Semantic organization Topic group Field structure	Ensuring ships navigational safety is a complex multi- faceted problem that can only be solved while considering the human factor, and, consequently, the language component of this problem. Terms in general and navigational terms in particular, comprising the concepts of navigational safety, acting as a tool of knowledge, are a very important component of the professional communication verbal aspect. Although being extensive the English terminology of navigation is not described systematically enough in its more specific sections, which leads to terminological synonymy and a variative interpretation of some terms. These problems prevent maritime transport from becoming safer. The study of semantic correlations in the space of navigation safety provides a deeper insight into the nature of the phenomenon under study. It also enables maritime English instructors to develop an effective mechanism based on the awareness of the correlation between terms subject and concept structures for students to master.

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## Analysis of the river cruise network in Southeast Asia: A complex network approach

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### Keywords

River cruise  
Network analysis  
Hub ports  
Port connectivity  
Complex network analysis

### Abstract

This study analyses the river cruise shipping network using complex network analysis. An analysis of 257 river cruise voyages operated by five cruise lines in Southeast Asia has found that the network consists of 31 cruise ports connected by 66 cruise routes. The network is a small-world network with the degree distribution following a power law, a short average path length and a large clustering coefficient. Few ports play a central role in connecting to others in the network. Siem Reap, Koh Chen, Ho Chi Minh City, Halong Bay and Thanh Pho Ninh Binh are hubs with high connectivity. Siem Reap also plays an intermediary role and has high reachability to other ports in the network with the highest betweenness and closeness centralities. The findings of the study are useful for cruise lines and port authorities to improve their operations and service network.

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## Effective Digital Training Solutions to Support the Maritime Digitalization and Decarbonization

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Keywords	Abstract
<p>*Corresponding email: tracy.plowman@dnv.com</p>	<p>The presentation describes DNV's maritime training department's activities in creating blended training courses to support key strategic developments in maritime digitalization and decarbonizing shipping. The courses combine Virtual Classroom (live online delivery via MS Teams), self-paced e-learning via Rise 360, and libraries of texts and videos from internal and external experts for selective drill-down on topics. Course formats and digital training options employed are described, together with the reasoning behind making these specific choices.</p>

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## Spatial-temporal Analysis of ship collision risk using Velocity Obstacle method: a case study in the estuarine waters of Yangtze River

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Keywords	Abstract
Ship collision Risk analysis Velocity Obstacle AIS Maritime Traffic	Maritime traffic is one of the most significant contributor to the development of the global logistics and economy. However, the occurrence of accident, especially ship collisions, have been continuously posing threat to the well being of the societies. To facilitate the management of regional maritime traffic and reduce the occurrence of ship collision accident. In this research, a velocity obstacle-based approach for ship collision risk analysis method is proposed. Firstly, a velocity obstacle-based algorithm is designed to integrated the influence of the target ships and the navigational environment to establish the velocity obstacles of the own ship. Second, a clustering-based method is introduced to identify the ships that have the potential for accident. A case study was conducted on the estuarine waters of Yangtze river, which is one of the most congested waterways in the world. The spatial-temporal characteristics of the results could be of benefit for the maritime safety administrations to propose customised measures to maintain the traffic orders and the regional safety level.

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## The capsizing risk assessment index for small fishing vessels

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Keywords	Abstract
GM Ship stability index Stability Parameter Wave height Rolling angle IMO stability regulations Stability assessment	<p>Ship capsizing accidents cause serious loss of life and property every year. Small fishing vessels do not have sufficient legal equipment to proactively detect and assess the risk of capsizing compared to general merchant vessels. Therefore, they are easily exposed to danger during voyage and capsizing accidents are frequently happening.</p> <p>In this study, a methodology was developed to evaluate the capsizing risk of small fishing vessels using three indices. The first is the stability index, which estimates the IMO Intact stability criteria with GM value. The second is the roll index, which is the ratio of the current rolling angle to the vessel's immersion angle. Finally, the wave index was adopted to express the risk of capsizing using the current stability situations and the wave height obtained from ocean data buoys.</p> <p>These indices are made into the capsizing risk assessment index that represents the stability performance and the risk of capsizing. This will help the captain to comprehensively determine the current ship's capsizing risk and to promptly response to the vessels' dangerous situation.</p>

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## Short Term Impact of Seascout Accident: A Spatio-Temporal Case Study for Al Duqm Sea Area, Oman

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Keywords	Abstract
Spatio-temporal analysis Ship accidents Automatic identification	<p>The Automatic Identification System (AIS) is a system that can transmit the position of a ship to other ships and facilities on land. Merchant ships are authorized by the International Maritime Organization (IMO) to broadcast their positions with AIS so that other ships can track them. In this study the xyz.ai artificial intelligence-based platform used in analysis is a Geographic Information Systems (GIS) software created by Lida Joly and Bart Adams. Support was received from Mathieu Strobbe of xyz.ai for using the location analytics software. As the data set, a 3-week ship traffic data set of Spire Maritime based on the AIS system and produced by ships around the world was used. In this study, the effect of the SeaScout ship accident on the ship traffic in the Al Duqm sea area of Sultanate of Oman was tried to be revealed. Spatio-temporal methods were used in this study. Spatio-temporal analysis refers to the techniques and methodologies involved in analyzing data sets that contain both relative and absolute positions in three-dimensional space, as well as time-related attributes. It is a special type of analysis because spatial data have a pervasive spatial correlation, and the time dimension is both random and complex, so the analysis has to take all of these factors into consideration. Al Duqm is in the Al Wusta region of Sultanate of Oman. Analysis results show that, there is any significant change for Al Wusta region but significant decrease for Dhofar and increase for Musandam and Muscat regions. The change in ship movements in the region could have been shown more sharply if much more historical data sets regarding the geographical area where the accident took place had been accessed but this study especially showed that; the spatio-temporal analysis method can be used to understand how maritime traffic is affected in the accident region with the help of AIS data when a marine accident occurs in different regions of the world.</p>

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## The redesign canvas: Conventional logistic into Halal logistic business model canvas (HLBMC)

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Keywords	Abstract
Halal logistics Canvas Model Small Medium Enterprise	Halal is a term originates from an Arabic phrase that brought the meaning of allowed or permitted by Islamic Law. The demands for Halal products and services keep increasing year by years. The logistics service providers need to think on how to mitigate the needs of Halal products and services by innovating their business style. This study attempts to redesign Halal logistics business model canvas from conventional logistic services. This research uses a case study method on a small medium enterprise. The empirical study was based on focus group discussion, document analysis and narrative review. The focus group discussion was used to refine the HLBMC canvas in order to ensure it meets the needs of organisation while confirming to Halal enforcement body in Malaysia. The final version of HLBMC emphasis on delivering values (trust, Halal certification) instead of profit driven. The redesign canvas can help advance both the theory and practice of Halal logistic business.

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## India's 'double fish hook' strategy: Technological and Logistical Aspects

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Keywords	Abstract
String of pearls Logistics agreement Port development Berthing Basing rights Diego Garcia	China's string of pearls has got new attention in the context of developing of ports in and around India, particularly with reference to Gwadar ,Chittagong, Kyakphau and Hambantota .This also overlaps with the developing the Belt and Road initiative which aims to develop surrounding ports in Asia and Africa. In this context it is regularly stated that India has not devised a policy to counter the string of pearls strategy of China. In order to offset the 'string of pearls' India has devised its own strategy of empowering the islands and having viable infrastructure and different mechanisms to counter the China threat. This paper talks about the nodes and arrangements that India has made which when connected give a glimpse of its 'double fish hook' strategy.

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## The Promotional Measures for the Thai Merchant Fleet

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Keywords	Abstract
Policy formulation Thai merchant fleet Promotional measure for maritime business	<p>Geographically, Thailand has seaports in the Gulf of Thailand and the Straits of Malacca which connects the Pacific and Indian Oceans. And more than 90% of Thailand's international trade has been done via commercial shipping. Thailand's merchant fleets of 389 vessels are ranked 34th of 35 primary seafaring nations, or only 0.38% by dead weight tonnage. Seventy percent of Thailand's GDP is generated through international trade. The purposes of this research were threefold: 1) to study the policy and measures of the government to promote the Thai merchant fleets between 1978 and 2016, 2) to study the problems of the Thai merchant fleets between 1978 and 2016, and 3) to develop recommendations for measures to promote the Thai merchant fleets. The hypothesis of the research was that the government merchant fleet promotion measures affect the expansion of the fleets. Data were collected through relevant documents and in-depth interviews, which included government officials involved in policymaking and policy implementation, as well as administrators in public and private sectors involved in the maritime business. The following data were gleaned from both the documents and interviews. Research findings showed that the cause of the problems in terms of fleet promoting measures could be attributed to inadequate follow-up and evaluation. The measures were neither systematic nor continuous. The fact that the Thai merchant fleets had not been well developed was due to the problems in formulating and implementing policy and measures of the government. In terms of recommendations for the two levels of committees: policy-making levels and monitoring of policy complying level, 1) utilizing both sides of the waters (Gulf of Thailand and Andaman Sea) should be investigated, 2) infrastructure implementation should be promoted. This included Phase 3 of Laem Chabang Port as a hub for transshipment, multi-modal operator (MTO) transport infrastructure, exemption of value added tax for shipping companies, Multimodal Transport Operators establishment to support the commercial maritime industry, one-stop service, electronic document acceptance, ship inspection for ship registration, acceptance of vessel inspection by ship inspection institute (classification society).</p>

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## A freight transport model to improve multimodal and intermodal freight transport services to the BIMSTEC member countries by centering Chattogram Port

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Keywords	Abstract
BIMSTEC Connectivity Transport Network, Bay of Bengal, Intermodal Transport Chattogram Port	<p>Abstract: The Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation (BIMSTEC) is a regional forum to develop connectivity in South and Southeast Asia. “Connectivity” is one of the key cooperation sectors of BIMSTEC among the listed seven sectors for developing the countries in the vicinity of the Bay of Bengal. The motto of "Connectivity" is to create an integrated transport network for reaping the benefits of a free trade area, including the promotion of trade and investment. A significant component of this sector is multimodal and intermodal transport which aimed to establish seamless multimodal and intermodal transport linkages among the member countries by combining different modes of transport and set connections to inland clearance/container depots (ICDs) and dry ports as well as multimodal transport corridors from/to seaports. This research applied qualitative research methodology for reviewing BIMSTEC Master Plan for transport connectivity and scholarly research papers to extract the research gaps for developing a multimodal and intermodal freight transport model. The practical impact of this research is to extract a seaport that will support the BIMSTEC areas including the land-locked part where the intermodal freight transportation system will increase international trade and communication in Asia. The principal seaport of Bangladesh’s Chattogram Port is selected as a prime load center for this model. The developed transport model will help the two landlocked countries of BIMSTEC Nepal and Bhutan to diversify international trade within and outside of the region especially intermodal connections will inspire to set up manufacturing industries and export domestic cargo via Chattogram Port. These facilities are also suitable for the Seven Sister States(SSSs) of India which is basically a landlocked part of India. Overall, this paper aims to develop a freight transport model to improve multimodal and intermodal freight transport connectivity for BIMSTEC member countries in Asia.</p>

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# Could untargeted cyberattacks against a vessel constitute a malicious act in the context of marine insurance?

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### Keywords

Marine insurance  
Malicious act  
Cyber attack

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### Abstract

The maritime industry is surrounded by tradition and yet it is possible to find intelligent systems at every level, from ship construction to navigation, in order to make the shipping faster and more effective. Although this technology provides many advantages to the maritime industry, as a result, it becomes vulnerable to cyber attacks. A cyber attack could be described as any illegal activity that is conducted by malicious and nonmalicious actors to damage IT (information technology) and OT (operational technology) systems via the internet. And while it can be carried out in any form or shape, one of the classifications in which the direction of the attack is taken into account is the targeted and untargeted attack. As indicated by its name, targeted attacks are tailored to aim at certain organisations, whereas untargeted attacks do not need to be addressed at a specific entity, but anyone with vulnerabilities in their cyber security at the time can be the target of this attack. Whilst these attacks are not within the framework of traditional marine insurance policies, it is apparent that they have several common elements with a malicious act. This may raise the question of whether untargeted cyberattacks on a ship would fall under the perils of a malicious act. The malicious act is addressed under cl 1.5 Institute War and Strikes Clauses(Hulls-Time) under the 'perils' heading, as follows: 'Subject always to the exclusions hereinafter referred to, this insurance covers loss of or damage to the Vessel caused any terrorist or any person acting maliciously or from a political motive. The aim of this research is to explore the elements of untargeted cyber attacks and malicious acts and discuss further whether they could overlap.

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## **Sessions : Marine Engineering and Management**

**Date – Time : Tuesday 28 February 2023 – 1.00 – 4.00 p.m.**

**Venue : *Space 4***

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- 1) Teaching Marine Engineering Terms Through On-Line Methods Within the Framework of Training Courses**
- 2) Modelling and Analysis of the Voyage Cycle for Ferryboat Electrification**
- 3) Re-Creating 3D Ship Geometries as Maps for Inspection and Reporting**
- 4) An Experimental Demonstration of the Methodology for the Simple Assessment of the Safety of Stability of a Training Ship Stability in Real-Time using Roll-Period**
- 5) Comparison of USV thruster configurations**
- 6) Study on the remelting process of Al-Si alloy refined with Al-Ti-B master alloy**
- 7) The microstructural improvement of Al-Si alloy using Al-Er master alloy**
- 8) The microstructure and hardness property alternation of a tool steel using the sub-zero treatment**





## Teaching Marine Engineering Terms Through On-Line Methods Within the Framework of Training Courses

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Keywords	Abstract
Marine engineering terms Online technology Foreign language competence Terminological component	<p>Verbal communication is an integral part of seafarers' professional activity and a compulsory condition of vessels' safety, prevention of marine environment pollution, fulfillment of international and national legislation in the field of sea transport, as well as organization and management of sea transport traffic involving international mixed crews. The International Convention on the Training and Certification of Seafarers and Watchkeeping of 1978 (STCW-78) defines the requirements for the level of a marine specialist foreign language training. Special attention is paid to the importance of seafarers' knowledge of maritime terms<sup>1</sup>. The present study contributes to the resolution of professional communication linguistic support problems within the framework of the marine engineer's activities. Besides, it ensures the safety at sea by the developing of the terminological component of the foreign-language competence.</p> <p>The purpose of the research presented in this article is to identify patterns of teaching the English maritime engineering term system through on-line tools using electronic resources in oral professional communication and technical documentation.</p> <p>The concept of the maritime engineering term as well as the principles of its differentiation from the more general concept of «maritime term» was considered to achieve this goal. Maritime engineering terms were classified thematically and structurally regarding their combinability and potential to form speech patterns both in oral professional communication and documentation on board. New structural models were described accordingly. The theoretical and practical value of the present research is conditioned by the fact the study represents an attempt to comprehensively analyze maritime engineering terminology in the context of its ability to be presented through online technology. Creative online methods offered and analyzed in this article can be applied in training, refreshing training ME course.</p>

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## Modeling and Analysis of the Voyage Cycle for Ferryboat Electrification

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### Keywords

Simulink  
Voyage cycle  
Passenger ferry

### Abstract

Voyage cycle modeling of the Pasig River fleet is presented in this work to provide an overview of the energy requirements in preparation for fleet electrification. The model includes fuel and energy consumption estimation based on the survey data collected from the ferry voyage, where speed is logged using GPS coordinates. The data gathered, ferry specifications, and engine characteristics were used to develop a Simulink model that produces estimated fuel consumption and energy consumption of the ferry. Based on the initial results, the model produced percentage errors from 2.25% to 12.94% compared to the actual fuel consumption. The voyage cycle data was used in battery discharge simulations to validate if the target battery design would be able to supply the electric energy needed of an equivalent electric ferry system.

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## Re-Creating 3D Ship Geometries as Maps for Inspection and Reporting

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Keywords	Abstract
Coastal Vulnerability Sealevel Rise Inundation Erosion Economic loss	We give an overview of describing hull surfaces, with a special focus on re-creating existing hulls where the original hull design description is not available in digital format. If not used to design and build ships, such recreation of hull shapes does not violate intellectual property rights. There is an increasing demand for approximate recreation of hull shapes for energy efficiency applications, such as trim optimization and robotic hull cleaning. Key technologies are parametric hull descriptions and 3D scans. The key processes and options are described. It is recommended to use dedicated service providers for the task.

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## An Experimental Demonstration of the Methodology for the Simple Assessment of the Safety of Stability of a Training Ship Stability in Real-Time using Roll-Period

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Keywords	Abstract
Ship stability GZ curve IMO stability regulations Stability assessment Roll-period Digital clinometer	Monitoring the condition of ships' insufficient stability in real-time is highly important to protect them from capsizing accidents which could lead to huge fatalities and environmental disasters due to oil spills. Hence, the development of the system for precisely monitoring ships' stability conditions in real-time is essential to alert the risk to the safety of ships' stability captains, officers, and crew. This study experimentally demonstrates the accuracy of ship's metacentric height (GM) estimated by roll-period measured by its digital clinometer of a training ship in real-time. This study clearly shows the accuracy of ship's GM estimated by training ship' digital clinometer to assess its stability conditions in real-time and the requirements for the improvement of the system in future works.

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## Comparison of USV thruster configurations

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Keywords	Abstract
Task performance Power consumption Fault tolerance	Unmanned surface vehicles (USVs) are more and more employed nowadays. Most of their tasks can be categorized into either station keeping or path following or combination of both. Thruster configurations affect undoubtedly USVs capability to perform their tasks. Some thruster configurations may be suitable for station keeping, some other for path following, whilst some are more versatile. To better choose thruster configuration that is suitable for a specific task, understanding of the thruster configuration characteristics is necessary. In this study, mostly used thruster configurations are compared using simulations. The simulation results demonstrate the effects of thruster configuration on aspect of task performance, power consumption and fault tolerance.

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## Study on the remelting process of Al-Si alloy refined with Al-Ti-B master alloy

Prapasi Sungsuwan Konchum<sup>1</sup>, Prayoon Surin<sup>1</sup>, Chaiyawat Peeratatsuwan<sup>2</sup> and TheeChowwanonthapunya<sup>3,\*</sup>

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Keywords	Abstract
Remelting process Al-Si alloy Microstructure	Al-Si alloy is an important material used in marine applications due to its high strength to weight ratio and corrosion resistance. Basically, this alloy can be improved using the addition of master alloy. Nowadays, the recycling process of aluminum alloys becomes more and more significant. Thus, the observation of the efficiency of master alloy on the refined Al-Si alloy is obviously required. In this study, the remelting process of Al-Si alloy refined by Al-Ti-B master alloy was conducted to gain the better understanding in the change of microstructures taking place in each remelting number. The results show that the prolonged remelting process resulted in the increased grain size of Al-Si alloy. Simultaneously, the reduction of titanium and boron concentration was obvious. The microstructure change together with the decreased concentration of titanium and boron was highlighted and discussed.
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## The microstructural improvement of Al-Si alloy using Al-Er master alloy

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Keywords	Abstract
Al-Si alloy Master alloy Microstructure	Nowadays, Al-Si alloy becomes one of interesting engineering materials used in a wide range of maritime applications. The improvement of its microstructure by the use of master alloys is thus important and the investigation of the microstructural improvement is therefore required. In this study, we investigated the microstructural improvement of Al-Si alloy after the addition of Al-Er master alloy using macrograph and cooling curve technics. The results show the addition of the master alloy into the melt of Al-Si alloy resulted in the decreased eutectic reaction temperature and subsequently the reduction of the eutectic silicon size. The alternation of the microstructure and solidification due to the addition of this master alloy was discussed and presented.

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## The microstructure and hardness property alternation of atool steel using the sub-zero treatment

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Keywords	Abstract
Sub-zero treatment Microstructure Fine carbides	In maintenance activities in maritime applications, tool steels are employed as cutting tools. During cutting periods, they are subjected to the severe conditions, i.e. wear, stress and heat generated from cutting. All can significantly reduce the life of tool steels. Thus, improving the properties of tool steels is essential for marine engineering. In this work, we applied the sub-zero treatment to SKD 11 tool steel as a supplemental process. This process was conducted at temperature of -50°C, -100°C and -190°C with the holding time of 2 hrs. The results showed that applying this process can promote the formation of the fine carbides, resulting in the improved properties of SKD tool steel. The evolution of microstructure of SKD subjected to the sub-zero treatment was presented and discussed.

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## Marine Digital Twins for Smart and Autonomous Vessel Navigation

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<b>Keywords</b>	<b>Abstract</b>
<p>*Corresponding email: allan_magee@tcoms.sg</p>	<p>The maritime industry is undertaking a transformation towards smart systems used to augment conventional vessel crew and onshore management functions. The combination of digital design tools, smart sensing and data analytics and will eventually allow smart and autonomous systems to take over many of the tasks currently performed by the crew. In this talk, the role of digital twins in this transformation are discussed. Digital twins enhance the predictability of vessel behaviour in harsh environments and allow test-bedding such novel developments prior to deployment and operations. Data collection and comparisons with benchmark performance will enable designers and ship operators to meet increasing standards of safety and sustainability.</p>

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