

WEBINAR TALK ON

SHIP RESISTANCE AND POWERING

ORGANISED BY :
MARINE ENGINEERING AND NAVAL ARCHITECTURE TECHNICAL DIVISION

BEM APPROVED CPD: 2 REF NO: IEM21/HQ/218/T (w)



SPEAKER :
PROF. DR. ADI MAIMUN BIN ABDUL MALIK

REGISTRATION FEE :

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28 JUNE 2021 , MONDAY

3PM - 5PM

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SYNOPSIS

The knowledge of ship resistance and powering is an important aspect to be considered in ship design. Ship powering requirement is often requested by the ship owner and a contract is usually written before the construction of the vessel by the ship builder. Ship resistance is mainly from the drag of the ship's hull and the resultant wave making due to the interaction of the hull with the surrounding water. Whilst ship powering is the power required by the propulsion device to drive the ship's hull at the required speed. With all these considerations, the ship designer could determine the appropriate propulsion system for the particular ship design. Ultimately, an efficient hull and propulsion system will result in an environmentally friendly ship hull with minimum possible emissions of the exhaust gases.

In this presentation, firstly, a brief overview of the ship resistance and powering is given. This is then followed by presenting some experiences gained through the research work and model tests carried out at the Towing Tank of Universiti Teknologi Malaysia since its operation in the year 1997. Work on various ship hulls like Displacement hull, SWATH, Trimaran and Amphibious boat are given. Some aspects of shallow water and bank effects are also provided. In the age of computerisation, the use of numerical computation in CFD is also highlighted. The presentation ends with the current development of ship resistance prediction utilising the AI approach. In this approach, graph theory and machine learning methods are proposed in conjunction with Concurrent Engineering application in Preliminary Ship Design. It is applied to estimate the passenger ship preliminary powering requirements. Based on the identified hull parameter variables, data analysis is carried out to investigate their significance and interrelationships. It is then used to develop the machine learning model to predict the powering requirements.

SPEAKER'S PROFILE

Prof. Dr. Adi Maimun obtained his B.Sc in Naval Architecture from the University of Strathclyde, Glasgow in 1983. He joined Universiti Teknologi Malaysia (UTM) as a tutor the same year. He later return to Strathclyde University for his Masters and Ph.D. in Marine Technology and obtained his degrees in 1985 and 1993 respectively.

Dr Adi Maimun is currently serving as Professor of Naval Architecture at the Dept. of Aeronautics, Automotive and Ocean Engineering, Faculty of Mechanical Engineering. He was Head of Marine Laboratory (1986-1989), Head of Panel for Marine Technology (1999-2000), Head of Department for Marine Technology (2000-2007) and the Deputy Dean (Development) for the Faculty of Mechanical Engineering (2007-2011). Head of Marine Hydrodynamics Research Group, UTM (2010-present).

Dr Adi Maimun specializes mainly in the field of Marine Vehicles/Structures Dynamics using CFD, AIS, Time domain simulations and experimental work. He had taught, conducted research and consultancy work in the said field and had published over 70 papers in conferences and journals.

Dr. Adi Maimun is currently a Fellow Member of the Royal Institution of Naval Architects (UK) and a Chartered Engineer (UK). He had served as committee member for a number years for the Malaysia Joint Branch (MJB) of Royal Institution of Naval Architects (RINA) and Institute of Marine Engineers Science and Technology (IMarEST). He is currently the Vice-Chairman (2020-2021) for RINA-IMarEST MJB (Southern Chapter). In the international field he had served in the International committee board for the conferences of MARTEC (since 2002), APHYDRO (since 2002) and OMAE (2008). Local organizing chairman for MARTEC 2004 and APHYDRO 2010. Malaysia Correspondent member for International Ship and Offshore Structures Congress (ISSC) (2015-2016).

Current Research Interests – Prof Dr Adi Maimun bin Abdul Malik

1. Dynamics of marine crafts/vessels and offshore structures such as wing in ground effect craft (WIG), amphibious boat, underwater vehicle, FPSO, semi-submersibles, Tension Leg Platform (TLP), mooring lines and risers.
2. Air cushion effect on resistance and behavior of marine craft.
3. Marine renewable energy devices
4. Behaviour of vessels in restricted water.
5. Navigational safety and risks assessments of vessels in ports and in waterways.
6. Port Capacity study based on vessels movement and port related activities such as dredging.
7. Implementation of Integrated System and Concurrent Engineering in Preliminary Ship Design.