Technical Webinar

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Singapore Shipping Association

Preliminary Design of a Tanker Ship in the Context of Collision-Induced Environmental-Risk-Based Ship Design

by

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Date : 30 April 2020 (Thursday)
Time : Webinar will begin at 4:00 pm and ends at 5.30 pm

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Abstract

The presentation will detail an efficient, simulation-driven method for the preliminary design of a double-hull oil tanker where the oil outflow risk due to ship-ship collisions are considered alongside other conventional ship design merits.

The simulation procedure is established by integrating a probabilistic oil outflow model with common ship design software to evaluate various aspects of performance. The procedure is implemented in a parametric way, such that by systematically varying the parameters that define the design, large amount of design variants can be evaluated. The comparisons of several ship design merits, including safety, across the variants are discussed through a case study with a Suezmax tanker to get an insight into the trade-offs, which is crucial for modern ship design.

Decision in regards to choosing the optimal designs depends on the intended purposes and service profile of the vessel. When equal weights and thus no preferences were given to the design merits, the most favourable designs are concentrated in the smaller size segments, whereas in environmentally sensitive areas, when more preferences should be given to the designs with relatively low oil outflow risk, some larger vessels can become competitive too. Finally, the sensitivity of the preference factors is discussed.

About the Speaker

Dr Dimitrios Konovessis is Associate Professor, Engineering Cluster and Deputy Programme Director for the Marine Engineering, Naval Architecture and Offshore Engineering (MNO) undergraduate programmes at the Singapore Institute of Technology (SIT). He graduated with an MEng in Naval Architecture and Marine Engineering from the National Technical University of Athens and holds a PhD in Ship and Marine Technology from the University of Strathclyde.

Dr Konovessis has extensive expertise in the area ship design and design methods for ship safety, first-principles and performance-based approaches for risk-based ship design, human factors effects, operation and regulation, marine systems modelling, reliability and maintainability, maritime energy efficiency and environmental protection. He is Chartered Engineer (CEng) and Fellow of the Royal Institution of Naval Architects (RINA) and of the Institute of Marine Engineering, Science and Technology (IMarEST).

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