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PUBLIC SEMINAR

Energy Efficiency of Ships: Impact on Environment and Ship Safety

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Date: Tuesday, 8 September 2015
Time: 6.00pm to 7.00pm
(registration commences at 5.30pm)
Venue: Auditorium, Executive Centre
NTU @ One North Campus
11 Slim Barracks Rise, Singapore 138664

About the Topic:

It is today well established that human activities have a significant impact upon the levels of greenhouse gases in the atmosphere i.e. those gases that absorb and emit radiation within the thermal infrared range. The Intergovernmental Panel on Climate Change (IPCC) released in 2007 a report stating that "most of the observed increase in global average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic greenhouse gas concentrations". One of the main contributors of emissions of greenhouse gases due to human activity is the burning of fossil fuels. The total CO₂ emissions from shipping (domestic and international) amounted about 3.3% of the global emissions from fuel consumption during 2007. The central estimates in this "Second IMO GHG Study 2009", is that if no policy for the reduction of GHG emissions is implemented, the growth of shipping will result to an increase by 150% to 250% of the ship emissions relevant to their 2007 levels. Climate stabilization by 2100 at no more than 2°C warming over the pre-industrial levels will require significant reductions of CO₂ emissions by 2050 and the international shipping industry needs to participate in this process.

Responding to this, the International Maritime Organisation (IMO) released in 2012 guidelines on the method of calculation of the attained Energy Efficiency Design Index (EEDI) for new ships, IMO-MEPC.212(63). This is a major step forward in implementing energy efficiency regulations for ships, limiting both fuel oil consumption and toxic gas emissions, through the introduction of the EEDI limits for various types of ships. There are, however, serious concerns regarding the sufficiency of propulsion power and steering devices to maintain maneuverability of ships in adverse conditions, hence regarding the safety of ships, if the EEDI requirements are achieved by *simply reducing the installed engine power*. The talk addresses this complex problem in the light of most recent relevant research and latest deliberations of IMO.



About the Speaker:

Apostolos D. Papanikolaou, born in Athens-Greece, studied Naval Architecture & Marine Engineering at the Technical University of Berlin (Germany), where he received the degrees of Dipl.-Ing. in 1973, Dr.-Ing. in 1977 and Habilitation (Lecturer) degree in 1981. He served as Tutor, Scientific Assistant, Research Associate and Lecturer (Privat-Dozent) at the Chair of Ship Theory and Ship Design of the Technical University of Berlin in the period 1969 to 1984, Associate Professor at the Department of Ocean Engineering of the University of Hawaii (USA) 1981/82 and 1984/85 and as Visiting Professor at the Departments of Naval Architecture and Ocean Engineering of the Universities of Osaka and Osaka Prefecture (Japan), Hamburg (Germany), Berlin (Germany), Hawaii (USA) and Strathclyde (UK) (1991/1993/1994/1999/2000/2008/2013). He was elected Assoc. Professor at NTUA in 1985 and was promoted to Full Professor in 1988. He is Head of the Ship Design Laboratory since the date of the foundation of the Laboratory in 1989 (www.naval.ntua.gr/sdl).

He is Principal Investigator of over 75 funded research projects and author/co-author of over 540 scientific publications dealing with the design and optimization of conventional and unconventional vessels, the hydrodynamic analysis and assessment of the calm water performance and the performance of ships in seaways, the logistics-based ship design, the stability and safety of ships and related regulatory developments of the International Maritime Organization. He received various international prize awards for his research work and scientific contributions to ship hydrodynamics, innovative ship design and safety assessment, more recently the Lloyds List 2009 Greek Shipping award on Technical Innovation in tanker design (jointly with Germanischer Lloyd), the prestigious *Dr. K. Davidson medal/award* of SNAME for outstanding achievement in ship research in 2010 and the European Champions Award for Senior Researchers in Waterborne Transport in 2014. He is Fellow and International Vice President of the Society of Naval Architects and Marine Engineers (SNAME), of the Royal Institution of Naval Architects (RINA), the Schiffbautechnische Gesellschaft (STG) and the Japan Society of Naval Architects and Ocean Engineers (JSNAOE).