International Conference on Design & Operation of Passenger Ships
20-21 November 2013, RINA HQ, London, UK

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UNCONVENTIONAL DESIGN IDEAS OF RO-RO PASSENGER SHIPS: STRATEGIES AND RESULTS

Rob Grin, Jago van Heerd and Victor Ferrari, MARIN, Netherlands

There has recently been significant growth in the number and size of cruise ships due to the popularity of cruising. Many new ships carry upwards of 2000 passengers. This growth in passenger numbers has occurred at the same time as regulatory changes to ensure adequate margins of stability in calm and damaged conditions are made. Calculations are carried out during the design stage with these calculations starting from estimated loading conditions. However, the statutory requirements for confirming the accuracy and reliability of the lightship properties which form the basis of these loading conditions remain largely unchanged and do not reflect the increased risk presented by ever larger ships. In an effort to stay ahead of the competition, cruise ship operators regularly seek to improve both the appearance of and the amenities on their vessels, resulting in weight changes. This then results in ‘unofficial’ lightweight surveys to ensure that the ship still complies with statutory requirements. If, or when the changes are significant, official lightweight surveys will be performed. It is becoming increasingly popular to perform these surveys when the vessel is in service, thereby ensuring that if an inclining experiment is required, this can take place at the end of a refit or other suitable time. However, it is becoming more commonplace to undertake an inclining experiment with the ship in service. This paper aims to detail the practical difficulties in performing these checks with the ship in service and the attention to detail required to obtain an accurate result.

COFFEE

HYDRODYNAMIC ASPECTS IN THE DESIGN OF PASSENGER VESSELS

Rob Grin, Jago van Heerd and Victor Ferrari, MARIN, Netherlands

Nowadays naval architects are required to design passenger vessels with extremely high comfort levels, low operating cost and able to operate worldwide in both open ocean and in confined waters such as bays and rivers. Therefore, today’s designs require very good performance in calm water, excellent manoeuvrability and capability and should meet stringent seakeeping requirements. The present paper discusses in detail the principal hydrodynamic aspects that challenge the design of passenger vessels. The content of the paper is largely supported by recent hydrodynamic studies (numerical and experimental) performed at MARIN. The first part of the paper deals with possibilities and impossibilities of hull lines and appendage optimisation and the trade-off between minimum fuel consumption, manoeuvrability capability and passenger comfort. In this part also the propeller design and measures to keep good cavitation behaviour and vibration and noise levels as low as possible will be addressed. Secondly the manoeuvring capabilities on open sea and confined waters (e.g. crabbing) will be discussed. Thirdly, ship motions and related issues will be addressed. This include a broad range of seakeeping issues; e.g. roll stabilisation, discomfort due to first order ship behaviour and discomfort due to stern and bow flare slamming. Regulatory items like safe return to port, weather criterion. And safety issues like wave impacts on lifeboats and parametric roll.

RISK ASSESSMENT FOR PASSENGER SHIPS

Daniel Povel, FutureShip, Andreas Ullrich, Germanischer Lloyd, GERMANY

The recent number of incidents with cruise ships has reminded all stakeholders in the industry, that despite compliance with rules and regulations and the recently introduced SOLAS amendments and CLIA guidelines addressing operational issues, there is still a certain risk that for example propulsion and energy supply may get lost as a result of fire. Since 2010 passenger ship newbuildings have to comply with Safe Return to Port regulations which among others addresses the redundancy of propulsion and safety systems following a fire or flooding incident. This is a huge step forward as risk based methods will largely applied for the design of the ships and certain systems necessary for propulsion, energy supply and safety systems like sprinkler and fire detection. The methodology aims to ensure that a potential of a potential DC fault on other loads connected to the same bus or about its impact on the rest of the ship. In this work, a Medium Voltage DC all-electric ship integrated power system is modeled, from the power generation module to the overall performance of the vessel. In this work, a Medium Voltage DC all-electric ship integrated power system is modeled, from the power generation module to the system encourages the Captain to assume the role of Operations Director, acting as a leader while the team undertakes the operational task, ensuring that if an inclining experiment is required, this can take place at the end of a refit or other suitable time. However, it is becoming more commonplace to undertake an inclining experiment with the ship in service. This paper attempts to detail the practical difficulties in performing these checks with the ship in service and the attention to detail required to obtain an accurate result.

COFFEE
AN INNOVATIVE, ENVIRONMENTALLY AND ECONOMICALLY SOUND ALTERNATIVE TO UNDERWATER SHIP HULL COATING

Boud Van Rompuy, Founder and CEO of Hydrex

The type of fouling found on the underside of a ship's hull makes an enormous difference to that ship's environmental impact as well as to the integrity and safety of the hull. The most basic consideration is the protection of the hull. This includes, to an increasing degree, passenger travel in ice and polar regions. Another major consideration is fuel economy which is an environmental concern because of its contribution to greenhouse gas (GHG) emissions. Consequently, the supply of innovative, environmentally-friendly and economically-viable alternatives to traditional underwater technologies is of increasing importance. In this paper, the design and development of an innovative, environmentally and economically sound alternative to underwater ship hull coating is presented.

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COMPARATIVE ASSESSMENT OF ALTERNATIVE PROPULSION SYSTEMS OF FERRIES OPERATING IN ECAs

Gerasimos Theotokatos, University of Strathclyde, Glasgow, UK

The objective of this paper is to comparatively assess four main alternative propulsion plants based on reciprocating internal combustion engines of a typical ferry ship operating in Emission Control Areas (ECAs). Specifically, the DF engine propulsion plant is compared with a conventional Diesel engine plant. The cases of the installation or not of a Waste Heat Recovery system are also investigated. The DF engines are considered to operate using LNG and a small amount of MDO for initiating combustion, whereas the Diesel engines operate using low sulphur MDO. The propulsion plants and the WHR systems were modelled under steady state conditions, and the simulation results were analysed in order to compare the various configurations. Furthermore, using the simulation results, the improvement of energy efficiency design index (EEDI) is calculated and the impact of the WHR on the EEDI assessed. Finally, the Life Cycle Cost for each alternative propulsion plant is calculated and used for comparing an economical evacuation of the Dual fuel propulsion plant versus the conventional designs applied in ferries.

A STATISTICAL CONTROL OF THE SHIP FUEL CONSUMPTION

Bocchetti D. Grimaldi Group, Energy Saving Department, Naples, Italy, Lepore A., Palumbo B., Ivica Ancić, Anže Sešan, Nikola Vladimir, University of Zagreb, Croatia

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VENUE
The Venue for the conference is the RINA Headquarters, 8-9 Northumberland Street, London, UK

EVENING DRINKS RECEPTION
Following the end of day one (20 November 2013), delegates are invited to attend an evening drinks reception at the conference venue.

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Upon registration you will be provided with details of a hotel booking service offering reduced rate accommodation for conference participants.

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