Report - CIMAC Circle at Electric & Hybrid Marine World Expo Virtual Live 2021 (January 19, 2021)

CIMAC, in its continued endeavour to further the development of the large engines industry, held a first CIMAC Circle at Electric & Hybrid Marine World Expo Virtual Live 2021 on January 19, 2021, albeit virtually this time owing to the current situation worldwide. The session was titled "Electrification/Hybridization – A Solution for Every Ship Type?" to discuss the important topic of system integration in the maritime industry today.

The CIMAC Circle was chaired by Prof. Dr. Hinrich Mohr, Owner, GasKraft Engineering, Germany, offering expertise from his vast experiences from both the industry side and the university side. The panel was completed by distinguished experts from the industry as follows:

- Marco Thömmes, Director Electric & Electronic, Rolls Royce Power Systems, Germany
- Stefan Goranov, Program Manager - Digital & Hybrid, Winterthur Gas & Diesel, Switzerland
- Erik-Jan Boonen, Principal Research Engineer, Damen Shipyards, Netherlands
- Geir Bjorkeli, CEO, Corvus Energy
- Morten Vejlgaard-Laursen, Director & Head of Electrical and Automation, Maersk A/S, Denmark

After a short introduction from the Chair to CIMAC and the CIMAC Working Group 20 'System Integration' entrusted with organizing the panel, the session commenced with a Keynote presentation from Morten Vejlgaard-Laursen, Director & Head of Electrical and Automation, Maersk, who presented the Ship Owners/Operators view on the topic, especially from the large container vessels' side. He touched upon the important factors playing a role such as sustainability and decarbonization challenges, sustainable fuel cost premiums, the need for flexibility and adaptability towards sustainable power systems and sources as well as technology developments that will drive the electrification and hybridization in the industry.

The panellists debated on the definition of hybrid system today, where it was felt that the industry had to adapt common definitions and standardize this going forward such that all stakeholders have the same foundations while working towards developing new and advanced systems. System integration is a complex task and while the average lifespan of a vessel is about 25-30 years, good standards will mean that even after 10 years into existence integration of sub-systems and new technologies on a ship will follow standard principles with standardized interfaces.

Over the course of the discussion, the panellists touch upon various topics such as best suitable vessel types for electrified powertrains, retrofits with new systems, propulsion solutions with alternate fuels of the future, and the current regulatory scenario with regards to system integration. One of the important aspects that was pointed out was the advancement in co-simulation platforms to develop advanced complex systems that must interface and interact with each other in a global system.

It was agreed that we will see more electrification in short-sea and smaller vessels, but integration of different and new systems will continue to expand across the different range of vessels. Also, overall efficiency improvements would necessitate reliable power and energy management systems, and this is only possible when systems communicate with each other efficiently. The Chair and the panellists concluded pointing to the importance of collaboration amongst industry stakeholders on the topic, to work towards standardization of modules and interfaces with good industry wide engineering practices such

that all the stakeholders are in good stead in an environment of new technologies emerging rapidly and the ever-changing legislations landscape with regards to how we manage systems and their interfaces.