ZAGREB, CROATIA, SEPT. 22, 2023

Green, Silent, Bio-Mimetic, and Intelligent Shipping

- Addressing the Challenges of Sustainability, Clean Energy, Efficient And Eco-Friendly Operation, Operational Ergonomics and Marine Career Landscape Transition
- Organized by the Faculty of Mechanical Engineering and Naval Architecture of the University of Zagreb, Croatia with participation from ABB Marine & Ports
- Presenter, and moderator of Q&A session:

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Join us in Zagreb, Croatia on **22. Sept. 2023 from 9:30 a.m. to 11:00 a.m.** for a hybrid event, at the venue of the Faculty of Mechanical Engineering and Naval Architecture of the University of Zagreb (**Petrius Business Center, Radnička cesta 177, Zagreb, 1st floor, room S3**), or on **Microsoft Teams**, for a 45 min plenary session, followed by a 45 min Q&A session with ABB's leading experts in the topics of green, silent, bio-mimetic, and intelligent shipping.

Commercial shipping is the glue that binds our Blue Planet together. Tankers and bulkers contribute to energy security and efficient allocation of industrial feedstock to the productive capacity of high-value-added goods. Large freight carriers (liquid and bulk) are critical in arbitrage between parts of the world where fossil fuels, as well as feedstock minerals for modern electrical and electronic industries (lithium, cobalt, neodymium, niobium), or nuclear fuel, are abundant, and economies, where they can efficiently, sustainably, safely, and at large scale, be put to use, manufacturing the prerequisites and components of our modern world. In the opposite direction, container ships and car carriers distribute high-quality, safe, and sustainable industrial goods across the world's strengthening economies and to the rising global middle class.

On the other hand, the integration of societies through migration, commuting, or tourism, as well as the free movement of labour, allowing novel relationships of production, are critical components in building and maintaining lasting peace and prosperity. As such, they still depend in large part on passenger maritime transport. Internal seas and waterways of large and integrated geopolitical and economic regions, such as the Baltic, the Channel, the

Mediterranean, the Bosporus - Sea of Marmara - Dardanelles System, the Black Sea, the Sea of Malay, Straits of Malacca, the Japanese Sea, Oceania, and the Great Lakes teem with passenger ferries, catamarans, and hydrofoils.

Thirdly, novel, technologically intricate vessels are involved in the economic exploitation of the Ocean's vast resources – offshore construction of renewable energy infrastructure, hydrocarbon extraction, and increasing prospects for mining. Typically shore-bound food industries – aquaculture and fish farming – are also moving offshore to ameliorate negative environmental impacts from eutrophication of shallow seas. Lastly, since most of our planet is covered by the global Ocean, the ability to enforce peace and order, pre-empt violence and exploitation, and in general curtail malicious actors of all provenances is also an activity for which society needs ships of all shapes and sizes.

ABB Marine & Ports through its existing and developing technologies offered to the civilian and defence/security markets, as well as through the exciting self-funded R&D and R&D initiatives funded externally or through public-private partnerships, is bringing to bear systemic technological solutions to address these challenges. ABB has been among the world's leading producers, installers, and maintainers of electrical propulsion systems on vessels in the last 40 years, as well as of the automation of port cranes and cargo-handling solutions. In the last 5 years, interest, and consequently ABB's ideation, development, and engineering experience with green all-electric systems, based either on batteries or a combination of fuel cells and batteries, has sky-rocketed. ABB is also at the forefront of sustainability and efficiency with its onboard power solutions based around the Onboard DC Grid. DC distribution onboard strongly optimises for electrical efficiency of the total system as well as introduces flexibility to the vessel's general arrangement and equipment/machinery space planning and design. The highly trusted, mature, Azipod® electrical propulsion provides a dependable, efficient podded propulsion with the capability for precise all-weather dynamic positioning and close-quarters manoeuvring in the ranges of total propulsion power reaching up to 70 MW. Complementing Azipod®, the newly released biologically inspired Dynafin™ propulsion concept will lead to unparalleled mechanical efficiency (shaft HP to kN of thrust), as well as the capability to dynamically optimise the thrust generation regime for energy efficiency, resilience to disturbance in the forms of currents, wind-loads and wave forcing, or silent operation.

ABB also owns and engineers smart digital embedded solutions that control and coordinate electrical sources, storage mechanisms, and loads at the algorithmic level, with its Power and Energy Management - PEMS system, hybrid power-plant optimization (HyPPO), and Ice Mode. ABB also supports overall and holistic-level sustainability of global maritime supply chains and operations based on voyage optimization, remote diagnostics, and condition-based monitoring through its Oversea™ Fleet Management As A Service, provided in a joint venture with Wallenius Marine. Finally, ABB is deeply involved in the maritime careers/labour market transition through its Intelligent Shipping Programme focusing on stepping stones to full or partial ship autonomy, as well as human-factors-driven (attention, cognitive load, intuitive interfaces) remote operation concepts.

Prof. dr. sc. Vedran Slapničar