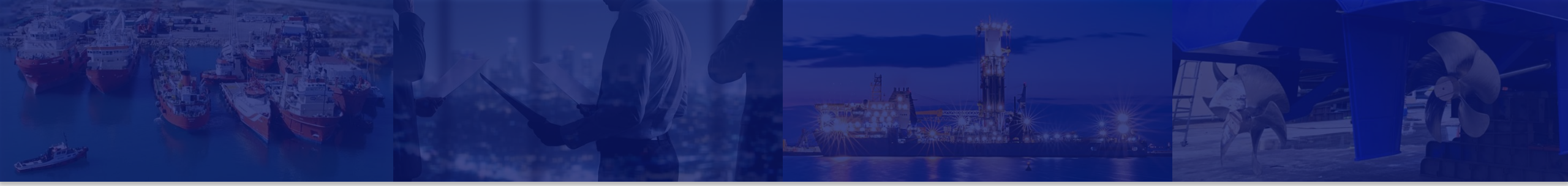

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# The Naval Architecture Challenges in the New Era

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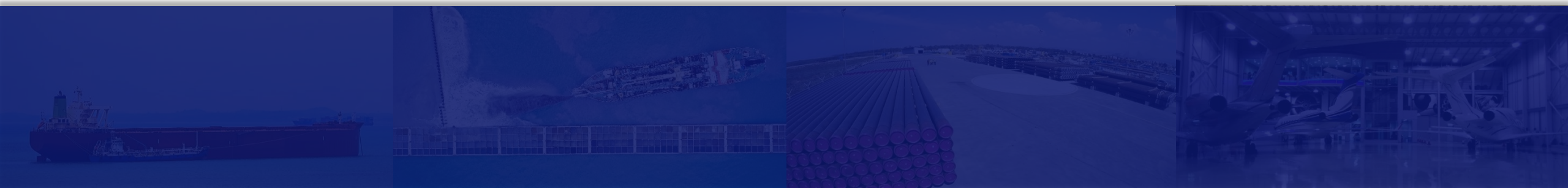


# What is Naval Architecture?

Definition

- Naval Architecture is field of engineering that specializes in the knowledge of design, inspection, construction, repair and operation of ships.

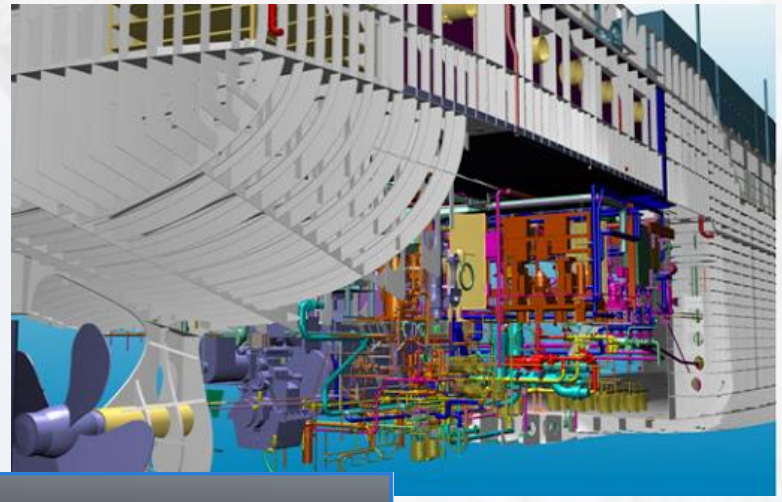

Multipurpose Offshore Support Vessel

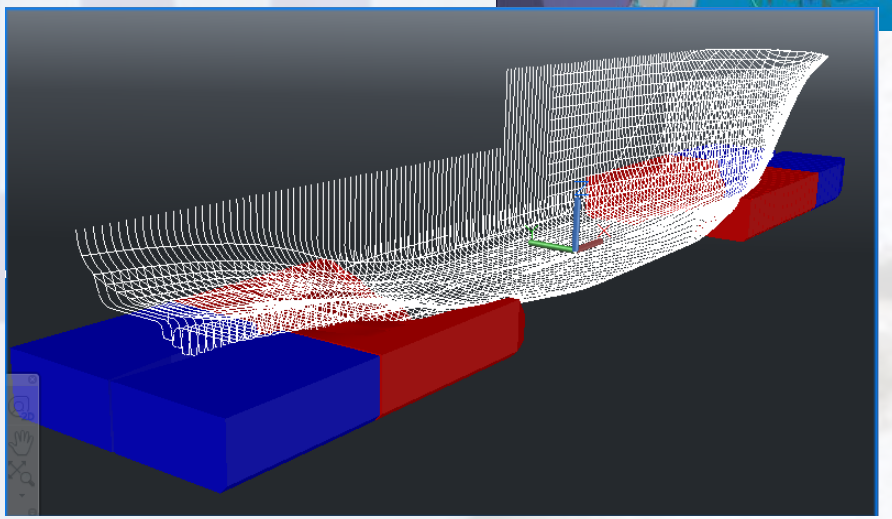
EDT Hercules

# What is Naval Architect?

The Naval Architect is the engineer who is specialized in ship and maritime technology.

The definition covers a wide range of activities and practical applications of the shipping industry and applies to all types of ships and other vessels ( or submarines)





# Types of Ships





# Evolution of Ships

The ship was the first transportation mean create by human. Historical records refer to the use of waterborne vessels as early as 4000 BC.

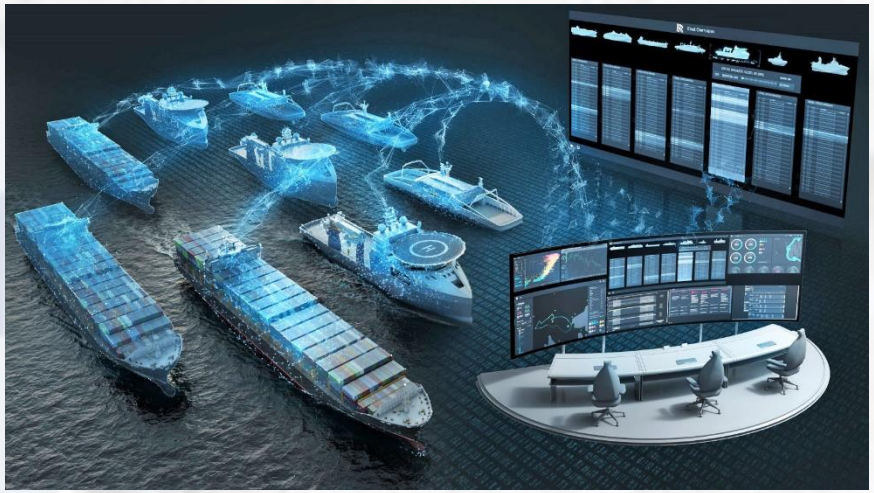
# New Challenges – What's Next

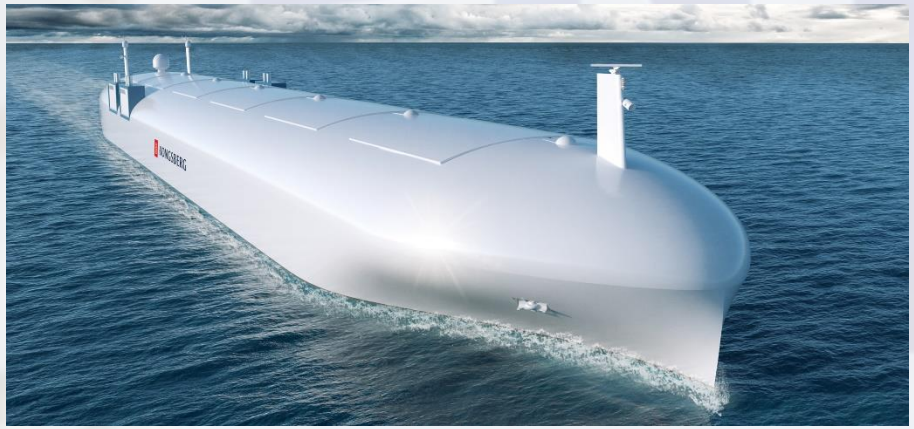
In our times we are in-front a new era of maritime sectors where major challenges need to be faced:

- Remotely Operated / Autonomous Ships
- Green Ship Design / De-Carbonization

# Remotely Operated / Autonomous Ships

Forecast showing that Remotely Operated Ships / Autonomous Ships will be the future of shipping. Autonomous and remote-controlled ships are being trialled in some sea areas.





# Remotely Operated / Autonomous Ships

Completely New Concept in Shipping.

Further to the operational aspects such control or the ships, redundancy, maintenance etc, The industry will have to face applicability of the International Conventions such us SOLAS , MARPOL etc .

# Green Ship Design / De-Carbonization

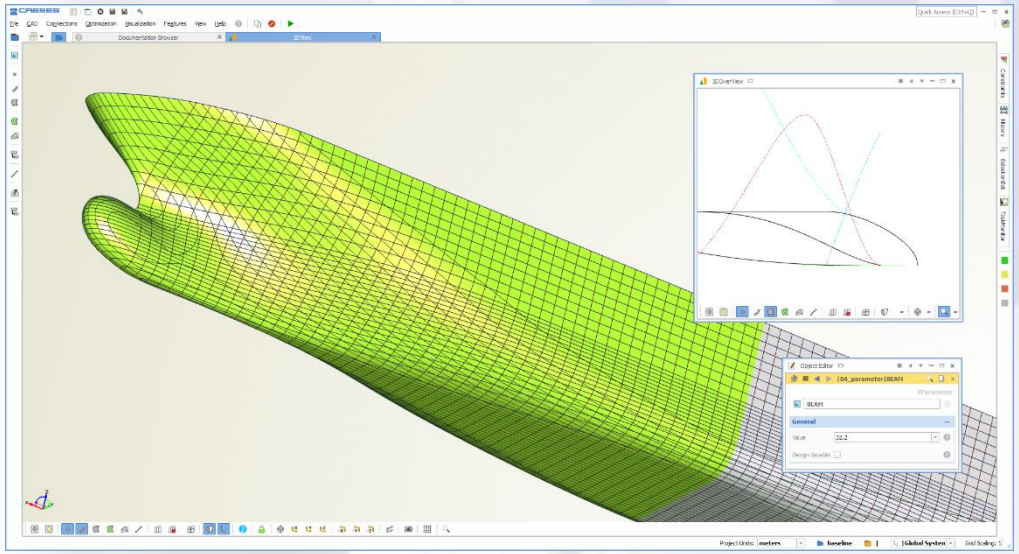
Shipping is experiencing increasing pressure to decarbonize its operations and to reduce emissions to air. In April 2018, the IMO adopted an ambitious GHG reduction strategy with a vision to decarbonize shipping as soon as possible within this century. With 2008 as a baseline year, this strategy aims to reduce with at least 50% total GHG emissions from shipping by 2050, while at the same time reducing the average carbon intensity (CO2 per tonne-mile) by at least 40% by 2030, and 70% before mid-century.

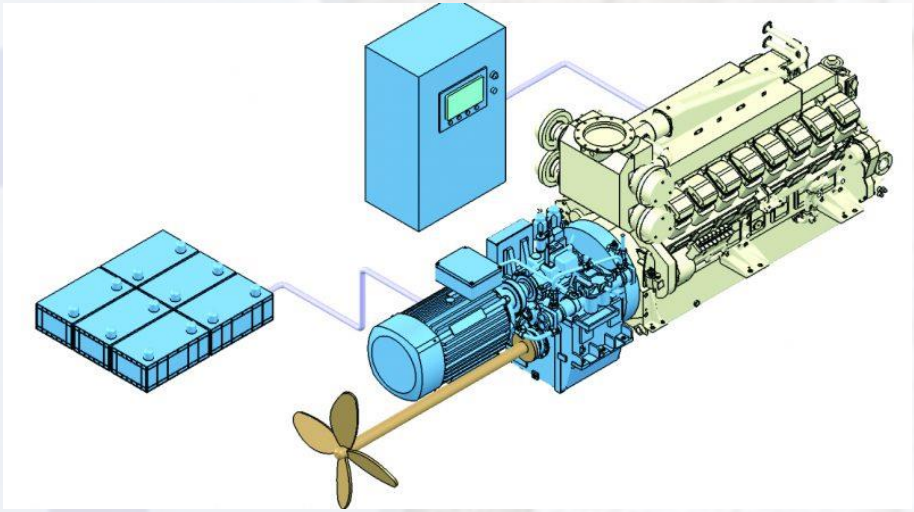
DNVGL Overview.

# Green Ship Design / De-Carbonization

Aiming to the goals the industry approaches a number of methods  such as:

- Hybrid  Propulsion System
- Alternative Fuels- LNG, Bio fuels  etc
- Optimized Hull Designs



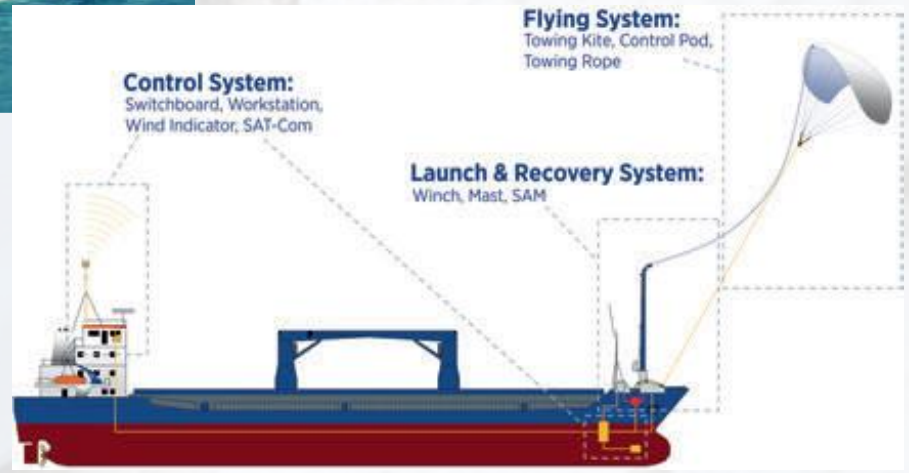


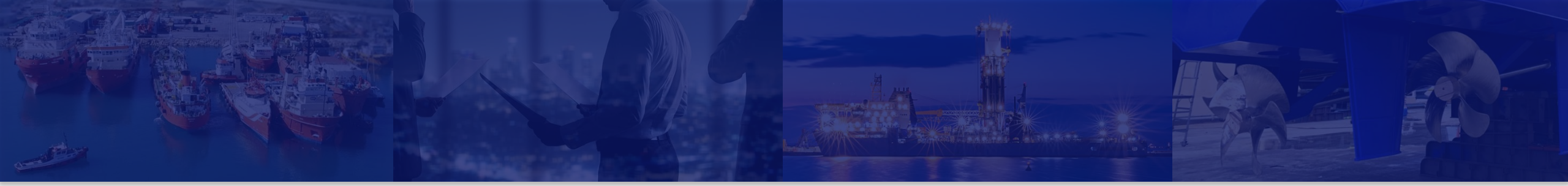
# Green Ship Design / De-Carbonization

Use of Renewables Energy Methods:

- Fixed wingsai designs
- Rotor Sails
- Kite-Assisted Sail
- Fixed Wing and Solar PV Hybrids







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# Thanks for your attention