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JOHN KOKARAKIS PhD
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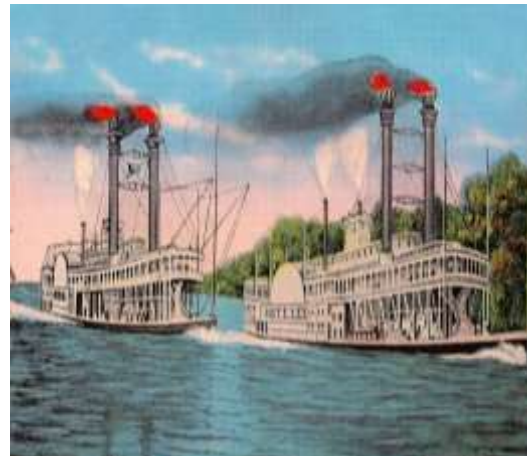
EFFECT OF REGULATIONS ON SHIP SUPPLY

Ships are as old as humanity itself



HISTORICAL CONTEXT OF MARITIME REGULATIONS

- Code of Hammurabi – Babylon 1754 BC – Master accountability
- Medieval Maritime Laws – Laws of Oleron – 12th Century
- The Age of Exploration – 15th & 16th Century - Spain - Portugal
- 19th Century – Steam –Plimsol marks 1870
- 20th Century – Titanic - SOLAS - MARPOL



IMPACT OF REGULATIONS

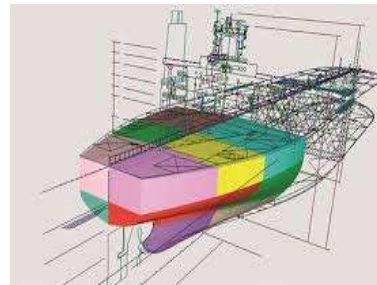
INVESTMENT DECISIONS

- Make investors more cautious
- Increase risk
- Investment in compliant ships
- Complexity imposes uncertainty
- Changes may devalue fleet



SHIP DESIGN

- Efficiency enhancement
- Alternative fuels
- Compliance with ILO
- Alternative materials
- Energy-efficient propulsion
- Structural integrity
- Fire protection
- Pollution control
- Crew safety



CAPACITY

- Time-consuming & resource-intensive
- Increase cost - decrease competitiveness & demand
- Affect production schedules
- Limit size & type of vessels



IMPACT OF REGULATIONS

FUEL SELECTION

- Fuel selection critical
- Transition to zero-carbon
- Price-Availability-Infrastructure
- Reduce environmental impact
- Novel fuel-handling & storage



MARITIME INDUSTRY

- Innovation drivers
- Optimized hulls & propulsors
- Refueling infrastructure
- Greener ports
- Alignment with sustainable goals



COST

- Increase CAPEX & OPEX
- BWTS & scrubbers
- ILO/MLC compliance
- Anti-dumping increases cost



ENVIRONMENTAL REGULATIONS ROCKING THE MARITIME INDUSTRY

Compliance has a price, as does non-compliance

- The global shipbuilding industry witnessed a dynamic year in 2023, marked by an increase of shipbuilding prices
- Regulations are a major driver of the surge in new buildings
- Capacity at the leading shipyards is declining and uncertainty about future fuels is amplifying concerns about a potential supply crunch in ship carrying capacity.
- The Maritime industry is looking into the future, obscured by uncertainty from a lack of clarity
- The ‘why’ of alternative fuel use is well understood, but the ‘how’ remains far from clear.
- Big and unanswered question: **“What is the fuel of the future?”**



REGULATIONS PLAY A MAJOR ROLE IN SHAPING THE SHIPBUILDING INDUSTRY

- Environmental regulations have become increasingly stringent in recent years, reducing GHG emissions, air, and noise pollution
- Fuel-efficient technologies and adoption of cleaner/greener fuels.
- Ship Owners need to invest in new technologies and processes to meet the new standards
- Development of new hull designs/propulsion systems/energy management systems.
- Aim at preventing accidents and safeguarding seafarers covering design, propulsion systems, fire safety, and crew training



BALANCING AMONG THE TSUNAMI OF REGULATIONS

- Over-regulation adds additional costs and complexity to the industry.
- Designers must incorporate the standards set forth by regulatory bodies such as the IMO.
- Regulations also shape ship scrapping practices.
- Recycling regulations aim to protect workers' health and safety, prevent pollution of the marine environment, and promote the reuse of ship materials.
- The design of ships must balance the competing demands of safety and environmental protection. Satisfaction of operational requirements and environmental standards.
- New technologies and design innovations are constantly emerging to meet these challenges.
- Regulations must ensure the safety and environmental sustainability of the maritime industry.



THE FUTURE OF MARITIME REGULATORY COMPLIANCE

- Shipowners find themselves in a dilemma: should they invest in fleet renewal without clarity on the best alternative fuel and green technology options?
- Or wait until the alternative fuel pathway and regulatory regime become clearer and more established before making decisions?
- Cooperation between stakeholders is the key
- Decarbonizing shipping requires major investments: just halving shipping emissions by 2050 may require \$1.4 trillion in investment.



THE FUTURE OF MARITIME REGULATORY COMPLIANCE

- Given the working life of vessels, many ships designed to be powered by fossil fuels are likely to remain in service by 2050, representing around 20% of the global fleet
- Given the high cost of net-zero fuels compared to conventional ship fuels, a key role of regulation is to make new fuels more cost-competitive
- Reduce the price differential between existing fuels and future alternative fuels
- Incentivize those who invest in new ships/technologies
- This can be achieved by the scale-up of new fuel production and distribution and by placing restrictions or levies on fossil fuels to make them more expensive
- One solution is to retrofit vessels to use carbon-neutral or zero-carbon fuels.



The two-million-dollar question

Feature	Retro	New
Cost	Green	Red
Time	Green	Red
Environmental impact	Red	Green
Compliance with regulations	Red	Green
Customization	Red	Green
Lifespan	Red	Green
Maintenance	Red	Green
Availability of shipyard	Green	Red

RETROFIT OR NEW-BUILD?

- It depends on the age and condition of the existing ship, the desired specifications, the cost of each option, and the availability of shipyard capacity.
- Retrofitting improves performance, efficiency, and safety. It may involve upgrading the propulsion system and/or generators, Fuel Supply System, fuel storage, safety systems
- A cost-effective way to extend the life of a ship and make it more competitive.

REGULATIONS AND INNOVATION

- Regulations can have a complex and multifaceted impact on innovation. Some regulations can hinder innovation, while others can stimulate it.
- For example, regulations that require extensive testing or to obtain permits before bringing new products to market can increase the time and expense of developing new innovations.
- Other regulations can stimulate innovation by creating new market opportunities or by providing incentives for businesses to develop new technologies.
- Regulations that mandate the use of cleaner fuels or that require new products to meet certain safety standards can create demand for new technologies that can meet these requirements.
- Regulations that require government funding for research and development can also incentivize businesses to innovate.



EFFORTS TO DECARBONIZE SHIPPING BEFORE 2050

- Uncertainty is one reason for anticipating a growing market for alternative fuel retrofits
- However, while the current IMO regulations are well intended, they are not perfect and must overcome challenges to reach their full potential for impact.
- There is a non-negligible risk that some of the energy efficiency regulations will lead to increased GHG emissions
- The most immediate way to reduce emissions is slow sailing. Ship owners can also retrofit their ships with energy-efficient technologies or use alternative fuels
- Underperforming companies may struggle to gain access to investors and capital.
- The EU has committed to updating its requirements if IMO measures, when introduced, are in line with its objectives.



EFFORTS TO DECARBONIZE SHIPPING BEFORE 2050

- Developing regions may face higher pressures due to the energy transition costs in shipping and the associated increase in maritime logistics costs.
- Global shipping continues to be under multiple challenges, including geopolitical tensions.
- While the energy transition in shipping is still in its infancy, some progress is underway, with most of the tonnage on order capable of using alternative fuels.
- Decarbonization efforts should bring together the broader industry, including carriers, ports, manufacturers, shippers, investors, energy producers, and distributors.
- Collaboration of stakeholders will be the name of the game



Navigating through unprecedented challenges

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