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Alternative Fuels

Interview: IRClass answers key questions on alternative bunker fuels

Mr. P.K. Mishra of Indian Register of Shipping, goes into details on new bunker fuels including challenges they pose on classification societies and expertise IRClass offers to overcome them.

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Singapore-based bunkering publication Manifold Times recently interviewed Mr. P.K. Mishra, Managing Director of Indian Register of Shipping (IRClass), on alternative bunker fuels including challenges they pose on classification societies and expertise IRClass offers to overcome them.

He also touched on the viability of nuclear for commercial maritime:

MT: Can you describe the new challenges IMO2030/2050 bring for classification societies, specifically in approving the new breed of vessels using alternative bunker fuels?

The IMO climate goals bring several challenges for classification societies, particularly in approving vessels using alternative fuels. One of the main challenges is ensuring the safety, reliability, and environmental compliance of these fuels, such as hydrogen, ammonia and methanol. Each alternative fuel has unique properties and hazards, requiring updated safety protocols, risk assessments, and design standards.

Classification societies are working towards developing new rules and guidelines for the construction, operation, and maintenance of vessels utilising such alternate fuels.

Another challenge is ensuring global uniformity and consistency in safety standards while addressing regional regulatory differences, which requires extensive collaboration with stakeholders, including shipowners, shipyards, equipment manufacturers, and regulatory bodies.

Sustainability is another aspect – though taken up at IMO level, the classification society has to provide the correct input/understanding to the ship owners and ship operators with regards to its compliance/usage on board and also about the benefits on CII and other incentives as will be decided at IMO.

MT: What are the expertise and solutions IRCLASS offers to overcome these challenges, and how do they differ from the competition?

Indian Register of Shipping brings a wealth of expertise in addressing the challenges posed by the new fuel ecosystem. Our approach is characterized by a deep understanding of both traditional and emerging technologies, while addressing specific needs.

We provide comprehensive services that include risk assessment, feasibility studies, and technical guidance for the integration of alternative fuels into vessel design and operations. Our unique differentiation lies in our commitment to innovation and our proactive approach to developing guidelines and rules for new technologies. IRS invests extensively in research and development to stay ahead of industry trends and regulatory requirements.

Additionally, our global presence combined with local expertise allows us to offer customized support, ensuring compliance with both international and regional regulations. This dual advantage of global reach and local presence, along with our strong industry partnerships, sets us apart from our competitors.

Mr. P.K. Mishra, Managing Director of Indian Register of Shipping (IRClass)

MT: In your opinion, which alternative bunker fuel offers the best solution for shipowners in meeting future IMO2030/2050 and FuelEU/EU ETS requirements? What are its pros and cons?

There isn't a one-size-fits-all answer when it comes to the best alternative fuel for meeting decarbonisation goals. However, each fuel option has its own advantages and disadvantages:

- **LNG (Liquefied Natural Gas)** is currently the most mature and widely available alternative fuel, with an existing bunkering infrastructure. It offers a significant reduction in CO2 emissions and virtually eliminates sulphur oxides (SOx) and particulate matter.
  However, LNG still emits methane (a potent greenhouse gas) during extraction and transport, which poses environmental concerns. It is also a fossil fuel, which may limit its long-term viability under future decarbonization goals and therefore may be considered as a transitionary fuel.
- **Hydrogen** has the potential for zero-emission shipping when produced from renewable sources. It is versatile and can be used in fuel cells or internal combustion engines.
  The storage and handling of hydrogen pose significant challenges due to its low energy density and high flammability. The production of green hydrogen is also currently energy-intensive and costly.
- **Ammonia** does not emit CO2 when burned, making it a promising zero-carbon fuel. It is easier to store and transport than hydrogen and has a well-established production and distribution network. Ammonia is however toxic and poses serious safety risks if not handled properly. The combustion process needs to be optimized to minimize nitrous oxide emissions.
- **Methanol** is easy to handle, biodegradable, and has a lower carbon footprint compared to conventional fuels. It can be produced from renewable sources like biomass and captured CO2. Methanol has a lower energy density than traditional fuels, which could affect ship range. It also still emits CO2, although at a reduced rate.

At this point in time when no green fuel is under production at scale and available, it is difficult to guess which future fuels will survive, or which of ammonia, hydrogen, methanol, LNG, LPG or additives-rich biofuels might dominate. Rather than one fuel, the industry will select different fuels for different types of ship, and it is important not to eliminate any of the current options too early as an industry.

MT: Taking into consideration future environmental regulations, what variables should a bunker tanker owner/operator, based in different regions around the world, take into consideration when choosing newbuilding criteria?

When choosing newbuilding criteria, bunker tanker owners/operators should consider several key variables in light of future environmental regulations:

Fuel Type and Flexibility: The choice of primary and secondary fuels is critical. Owners/operators should consider fuels that are compliant with current and anticipated future regulations, including IMO2030/2050 and regional requirements like the EU's FuelEU and ETS. Flexibility to switch between fuels could provide a competitive advantage.

Design and Technology: The vessel's design should incorporate energy-efficient technologies, such as hull optimization, advanced propulsion systems, and waste heat recovery systems. Hybrid or dual-fuel engines may provide flexibility and compliance advantages.

Operational Region: Regional regulations and fuel availability will play a significant role. Understanding the environmental regulations of the operating regions and the availability of compliant fuels and bunkering infrastructure is essential.

Lifecycle Costs: Consider the total cost of ownership, including capital expenditure (CapEx) and operating expenditure (OpEx). Investments in more sustainable technologies may have higher upfront costs but could result in lower operational costs over time due to fuel efficiency and reduced emissions penalties.

Safety and Compliance: Ensuring the vessel meets all international and regional safety and environmental regulations is paramount. This includes having the necessary certifications and adopting best practices for environmental performance.

MT: Taking into consideration future environmental regulations, what variables should a shipowner operating in different maritime sectors take into consideration when choosing newbuilding criteria?

Different maritime sectors (e.g., bulk carriers, container ships, tankers) have unique operational profiles, which impact fuel consumption and emissions. Shipowners should select designs and technologies that best align with their specific operational needs and regulatory requirements.

Fuel Type and Future-Proofing: Selecting the right fuel is critical, considering not only current but also anticipated future regulations. Ships that can operate on multiple fuel types may have a competitive advantage, providing flexibility as fuel availability and prices change.

Energy Efficiency Measures: Implementing energy-efficient technologies, such as advanced hull designs, air lubrication systems, and energy recovery devices, will help reduce fuel consumption and emissions, contributing to compliance with future regulations.

Technology and Innovation: Incorporating advanced digital tools for fuel optimization, emissions monitoring, and predictive maintenance can enhance operational efficiency and regulatory compliance.

Environmental Impact: Consideration of the vessel's overall environmental footprint, including emissions, noise pollution, and waste management, is increasingly important. Compliance with stricter environmental standards may require additional investment in technologies that reduce emissions and improve sustainability.

Cost Impact: The costing and future availability of fuel depending upon the vessel's operating profile plays a major role in selecting a new building project.

MT: Would nuclear power ever be considered a viable solution to power commercial maritime trade? What are its technological challenges to become a mainstream energy source for powering sea-going vessels, and how could they be resolved?

Nuclear power has the potential to be a viable solution for powering commercial maritime trade due to its high energy density, zero emissions during operation, and ability to provide continuous power over long durations without refuelling.

However, there are several technological, regulatory, and societal challenges that need to be addressed for nuclear power to become a mainstream energy source for sea-going vessels. Resolving these challenges would require significant advancements in nuclear technology, robust international collaboration on safety and regulatory frameworks, and addressing public and political concerns about the use of nuclear power in commercial shipping.

The challenges also involve economic viability compared to conventional ships, infrastructure deficit such as for port infrastructure required for nuclear ships.