

Sustainable Marine Fuel and Propulsion Technology: Towards Cleaner Oceans

In today's world of advance studies, the main objective of studies have shifted from just finding a solution to making a solution worth applicable and creditable. Even the modern marine technologies have been looking up to the same notion for a while now. Sustainable and renewable energy resources are the topics of major concern. Cleaner fuels leading to cleaner seas and safer ships for safer life at sea have been the motto of maritime fraternity. Moreover the management sciences too share their importance for the same. Smart and critical planning at shore as well as on board has been leading to the efficient and optimum use of the present technology.

Today the marine fuel and propulsion technology is a concerned area of research and development. Researches have been continuously working upon to enhance fuel and propulsion system. Fuel cells, dual fuel mixture and many more aspects in the study have been continuously upgraded to achieve cleaner and efficient fuel.

Presently, the types of fuels running heavy engines dealing high amount of torque and considered of high power uses fossil fuel. Types of the highly viscous forms of fossil fuels usually contains abundant amount of sulphur (upto 3.5% by mass) thereby forming high amount of SO_x along with substituent

NO_x . Both of them are the main cause of marine air pollution which accounts for a considerable proportion in global emissions. However, it is not necessary to find a new entity of fuel always. Existing fuels can be made into composition with additives that reduce polluting agents and serve economically as well.

Composite fuels have been a solution for eco-friendly fuels. The German Type 212, is a highly advanced design of non- nuclear submarine. It features diesel propulsion and an additional air independent propulsion system using Siemen's proton exchange membrane compressed hydrogen fuel cells. It can operate on high speeds by diesel propulsion and for silent cruising, air independent propulsion system is operated. While operating on such fuel cell technology, the submarine can be submerged for almost 3 weeks without surfacing having a little exhaust heat.

With scope of better and enhanced fuels, the research and development needs expensive studies with experiments. This may increase the price of the product. Hence the management too plays a role in achieving the product at minimum economy. The innovation need to be used in a planned manner in order to decrease its cost along with optimum use. It has been observed, fuels used in a planned way helps increasing the overall efficiency.

QUESTIONS

What can be the method/ technique such that new innovations can be installed within the existing vessels?

How cost over innovations can be managed to encourage adoption of technology faster?

Suggest some architectural designs which may help to upgrade existing machinery economically.

What could be the possible challenges in adopting new innovations and how can they be overcome?