Designing a Prototype of Passenger Ship with Solar Cell Drive System using Autodesk Fusion 360 Software with CFD (Computational Fluid Dynamic) Simulation

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ABSTRACT

The development and utilization of maritime renewable energy have been very restricted; similarly the application of renewable energy and the utilization of solar cell are also lacking. Therefore, the writers design the prototype of passenger ship with solar cell drive system using autodesk fusion 360 software. The prototype is designed in the main size of Length = 100 cm, Width = 30 cm and Height = 25 cm. The design mechanism includes hull, roof, shaft and propeller. The design is simulated using CFD (Computational Fluid Dynamic). The resistance of the prototype is in blast loading condition with speed variation of 1 knots, 10 knots, and 20 knots. At the speed of 1 knot, the resistance ranges in 30-40 cm/s with maximum velocity magnitude of 83,0971 cm/s, at the speed of 10 knots, the resistance ranges from 200-400 cm/s with the maximum velocity magnitude of 766,921 cm/s whereas at the speed of 20 knots, the resistance ranges from 400-800 cm/s with the maximum velocity magnitude of 1504,56 cm/s. Therefore, the speed of 20 knots within resistance range of 400-800 cm/s with the maximum velocity magnitude of 1504,56 cm/s do not damage the hull but the friction will increase due to the speed of the fluid.

Keywords: Solar Cell, Ship, Design, CFD