UNIVERSITI TEKNOLOGI MARA

Investigating Wave Interaction in Re-Engineered Bedar Boats Using Computational Fluid Dynamics (CFD) in Extreme Weather Conditions.

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ABSTRACT

The Bedar boat is a sailing boat mainly used for marine activities along the east coast of Malaysia, especially at Terengganu. The problem statement for this project is there is limited research about the Bedar boat's performance in extreme weather conditions, and its simulation using Computational Fluids Dynamics (CFD) software. Furthermore, the model of the Bedar boat doesn't have a detailed Computer-Aided Design (CAD). Therefore, a study about the Bedar boat will be researched in this project. This project has a gap of study which has limited use of CFD in Bedar boat analysis and detailed CAD design while CFD has become a standard tool in modern marine engineering. This can lead to leaving a gap in understanding how Bedar boats design and perform under simulated extreme weather conditions. The objectives of this project are to design a Bedar Boat using computer-aided design (CAD) in POLYCAD software and to simulate and analyze wave interaction between re-engineered Bedar boats under extreme weather conditions using computational fluid dynamics (CFD). This project will start by creating a 3D model of a Bedar boat. After that, the 3D model will be exported to Solid Works before analyzing the Bedar Boat 3D model in Computational Fluid Dynamic software which is ANSYS FLUENT. The drag force and total resistance result will be validated and determine whether the Bedar Boat can withstand extreme weather conditions. In conclusion, this project will help contribute to the preservation and modernization of Bedar boats it also preserves cultural heritage with cutting-edge technology to benefit coastal communities and the maritime industry at large.

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