

**“ DESIGN AND CONSTRUCTION OF A JET SKI PROPULSION
SYSTEM FOR WATER TOURISM FACILITIES AT MARINA
BEACH, BENGKALIS ”**

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ABSTRACT

This study aims to design, manufacture, install, and test a water jet propulsion system on a jet ski according to the characteristics of the hull. The research methods included resistance calculation using the Holtrop-Mennen method with the assistance of Maxsurf software, determination of engine power requirements, design of waterjet components, fabrication and installation of the propulsion system, and sea trial testing at Marina Beach, Bengkalis. The Maxsurf simulation results showed an engine power requirement of 7.875 HP; therefore, an 8.5 HP engine was used. The designed water jet components included a 120 mm diameter impeller with 3 blades, an 80 mm diameter nozzle, a 122.4 mm × 450 mm intake, a casing with a diameter of 122.4 mm and a length of 240 mm, and a 20 mm diameter shaft. Based on the calculation results, the system produced a thrust of 578.39 N. The sea trial results showed a maximum speed of 6 knots from the target of 10 knots, resulting in a decrease of 4 knots or 40%. The decrease in speed was influenced by the reduction in propulsion system efficiency from 60% under design conditions to 25% under actual conditions, the decrease in engine speed under load, and energy losses in the water jet system. The system remained capable of propelling and controlling the jet ski with a maneuvering angle of approximately 35°. These results indicate that the water jet propulsion system was successfully realized and functioned, but further optimization is still required to improve efficiency and actual speed in subsequent testing.

Keywords: Water Jet, Propulsion System Design, Maxsurf, Thrust, Efficiency, Sea Trial.