

**“ANALISIS PERBANDINGAN KEKUATAN STRUKTUR KAPAL  
UNMANNED SURFACE VEHICLE (USV) BERBAHAN GLASS FIBER  
REINFORCED PLASTIC (GFRP) DAN CARBON FIBER REINFORCED  
PLASTIC (CFRP) DI ROKAN HILIR”**

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**ABSTRACT**

*The design of the Unmanned Surface Vehicle (USV) ship in Rokan Hilir is a design carried out by the 2019 class of Bengkalis State Polytechnic Shipbuilding Engineering Students and was designed as a final project, previously designing the Lines plan and general arrangement with the main dimensions of the ship: length 3.5 meters, width 2.2 meters, height 0.65 meters, and draft 0.4 meters. Next, discusses the comparative analysis of the structural strength of the Unmanned Surface Vehicle (USV) ship made of Glass Fiber Reinforced Plastic (GFRP) and Carbon Fiber Reinforced Plastic (CFRP) for surveillance operations in the waters of Rokan Hilir. The structural analysis was carried out using the Finite Element Method (FEM) with reference to the Indonesian Classification Bureau (BKI) Vol. VII 2021. The simulation results show the maximum deformation in Glass Fiber Reinforced Plastic (GFRP) of 44.259 mm and Carbon Fiber Reinforced Plastic (CFRP) of 17.402 mm; The maximum stress (Von Mises) on Glass Fiber Reinforced Plastic (GFRP) is 4.345 MPa and Carbon Fiber Reinforced Plastic (CFRP) is 3.6343 MPa. Meanwhile, the normal stress that occurs on Glass Fiber Reinforced Plastic (GFRP) is 2.6408 MPa and on Carbon Fiber Reinforced Plastic (CFRP) is 2.159 MPa. The minimum safety factor on Glass Fiber Reinforced Plastic (GFRP) is 1.1507 and on Carbon Fiber Reinforced Plastic (CFRP) is 1.1006.*

**Keywords:** *Unmanned Surface Vehicle (USV), GFRP, CFRP, and FEM.*