

## **ABSTRACT**

*The Batam–Belakang Padang ferry route is an important sea transportation route for community mobility; however, the passenger vessels currently operating on this route still have limitations in terms of safety and comfort. This study aims to modernize the passenger vessel design through the development of a Lines Plan, General Arrangement (GA), hydrostatic analysis, stability analysis, and structural design. The methods used include observation, interviews, literature studies, and design using AutoCAD and Maxsurf based on the Parent Ship Method. The results produced a vessel design with principal dimensions of LOA 11.00 m, breadth 2.00 m, depth 1.20 m, and draft 0.60 m, with a capacity of 16 passengers and 1 captain. The hydrostatic analysis indicates suitable buoyancy characteristics, while the stability analysis complies with the criteria of IMO Resolution A.749(18). The structural design refers to the BKI Rules for the Classification and Construction of Wooden Ships. The modernization of the design improves safety and comfort through the implementation of a permanent cabin and additional supporting facilities.*

**Keywords:** *passenger vessel modernization, passenger vessel, Batam–Belakang Padang, hydrostatics, ship stability, wooden ship construction, navigation safety and passenger comfort.*