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Key Characteristics: Collision Avoidance • Reduction in the Stopping Distance during Braking •

Emergency Braking System for Small Crafts

The high rates of collision of service boats in the harbour areas emphasise the need to develop an efficient emergency braking system that does not affect the daily operation and increases the navigation safety at ports and harbours.

This project aims at designing such an emergency braking system for small service boats, preventing them from colliding with other vessels by stopping them within the shortest distance possible. The above-mentioned emergency braking mechanism consists of two light-weight stiffened plate systems located at the aft and fore bulkheads of the boat. These stiffened plate systems are mounted on the bulkheads and transmit the loads acting on them to the ship's primary structure for efficient braking.

In order to avoid structural damage to the primary ship structure due to extreme loads, sacrificial components are used in this system. The structural analysis of the plate systems was carried out using a FEMtool (Finite Element Model Tool), in order to ensure that the given scantling would be able to withstand the loads acting on them. Moreover, in order to establish the braking efficiency of the system, a Computational Fluid Dynamics (CFD) tool was used to calculate the resistance of the hull before and after the deployment of the emergency braking system.

The braking system was found to be very effective in reducing the stopping distance of the boat to less than the one–third of its overall length (LOA) when the boat was travelling at full speed and, at the same time, the structure was found to be robust with only the sacrificial components suffering severe damage •