

## Effects of the application of a stern foil on ship resistance: A case study of an orela crew boat

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### Abstrak

The effects of the application of a stern hydrofoil on ship resistance were studied numerically using computational fluid dynamics (CFD) and were verified using data from model tests. A 40 m planing-hull Orela crew boat, with target top speed of 28 knots (Froude number,  $Fr = 0.73$ ), was considered. The stern foil (NACA 64(1)212) was installed with the leading edge positioned precisely below the transom with angle of attack of 2 degrees at elevation  $0.853 T$  below the water surface (where  $T$  is the boat's draft). At relatively low speed ( $Fr < \sim 0.45$ ) the application of a stern foil results in an increase in ship resistance (of up to 13.9%), while at relatively high speed ( $Fr > \sim 0.55$ ) it results in a decrease in ship resistance (of up to 10.0%). As the Froude number increases, the resistance coefficient ( $CT$ ) first increases, reaches a maximum value, and then decreases. Its maximum value occurs at  $Fr \approx 0.5$ , which is consistent with the prediction of a resistance barrier at approximately this Froude number.