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## Stern Flap Solution to Contain the Speed Performance Loss due to the Ship Weight Growth: an Application on the “De La Penne” Destroyer Class

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It is well known that during the life-cycle the growth of the ship weight is one of the main source of the performance-loss. Stern flaps have been used in many recent designs of transom stern vessels, in particular by the US Navy, to increase top speed or to realize improvements in fuel economy over the operating range. Furthermore, stern flap implementation has also become a practical retrofit on existing platform because significant improvements can be achieved at minimal cost.

According to the US Navy experience, in order to analyze this aspect, the Ship Design Office of the Italian Navy General Staff has been performed a preliminary evaluation of the application of this device on own Destroyer hull (De La Penne Class), using the CFD U-RANSE approach and through experimental test campaign performed at Model Basin of CNR-INM (Council of National Research – Institute of Marine Engineering). This preliminary study was conducted in model and full scale: several flap angles have been tested with a fixed NACA profile. The results have shown that the major improvements, in terms of power reduction, have been obtained for the interest speed range ( $Fr_V = 0.94 - 1.18$ ).

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