Hydrodynamic Optimization of Ships in Service

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Nautical Aspects of Ship Dynamics, 3rd Squat-Workshop
University of Applied Sciences, Elsfleth, Germany
21./22. October 2009

Abstract

The high fuel oil costs are the reason that shipyards and ship owners focus on the reduction of propulsion power more than ever. For new building projects the most effective measure to minimise the vessels resistance is to choose suitable main dimensions in the first place, after which the optimization of the form should be considered. Both the main dimensions and the hull form hardly can be modified for vessels already in service. But there are still a lot of measures where the hydrodynamic performance of existing vessels can be improved, too.

In the paper presented the state of the art of propulsion improving devices are described. Furthermore we present examples of a possible refit of some propulsion improving devices and alternative propeller designs. Within conversion projects even a modification of the bow shape may lead to economical benefits, as shown in another example. The hull form optimization of a full block vessel in an advanced design stage is further presented. Finally a successful example increasing the deadweight carrying capacity and the stability of a RoPax Ferry is shown, without increasing the power demand at the same time.