ABS PROPULSION SYSTEM EVALUATION AND VERIFICATION

In an effort to improve ship performance, designers, vendors and shipyards investigate the best possible matching of propulsion system to the vessel's resistance over the entire operational profile of the vessel.

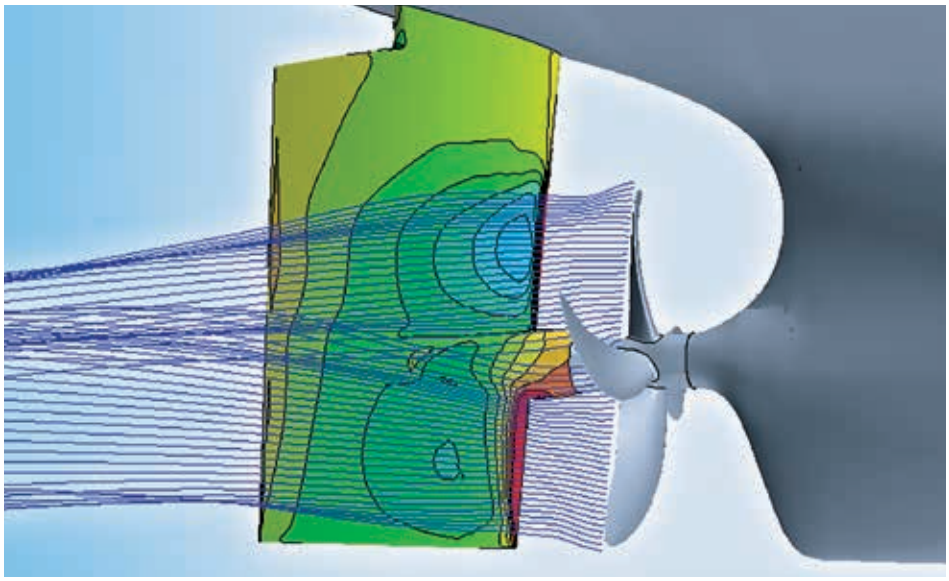
Defining the best match between vessel resistance, propeller and main engine requires a close cooperation between the propeller vendor, main engine manufacturer, ship designer, shipowner and other involved parties. Such investigations are performed with the use of state-of-the-art Computational Fluid Dynamics (CFD) tools.

The issue is equally relevant for new construction and retrofit projects, especially if the operational profile of an existing vessel is changed significantly from what was considered in the original design of the vessel.

This service is primarily directed toward commercial vessels such as container carriers, tanker vessels, bulk carriers, LNG carriers, RO-RO vessels, etc. However, as environmental regulations and global awareness are extended to other segments of the world fleet, such as offshore support vessels and tugs, hydrodynamic evaluation studies are also highly relevant to those types of vessels.

ABS' Energy Efficiency team offers a suite of hydrodynamic services to assist ship designers and operators in the matching of propeller and main engine to the vessel's design and evaluating the propulsive performance of the vessel design.

Based on the simulation results, the ABS Energy Efficiency team can suggest the best possible match for the



Once the initial powering performance is established, either by CFD analysis or by initial model tests, a typical evaluation study includes the following steps:

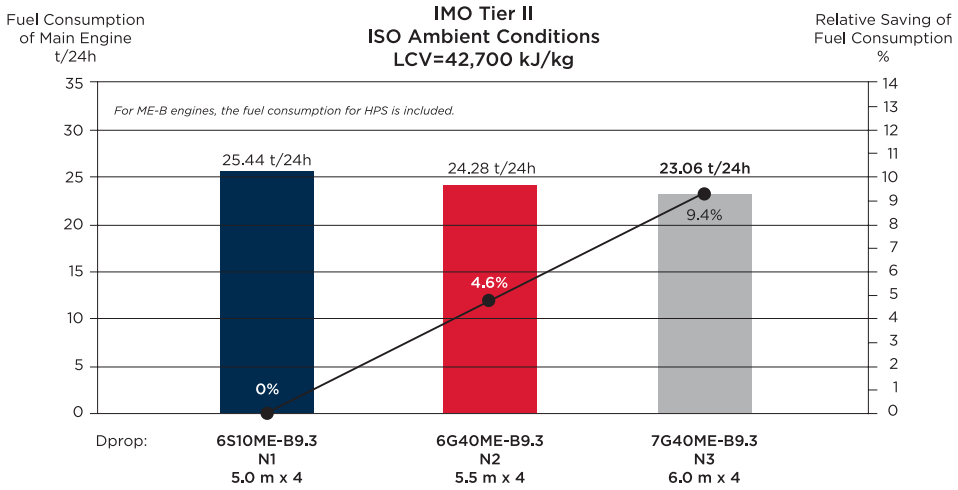
STEP 01	Review and discuss the vessel's design and intended operation to identify possible hard points in the design.
STEP 02	Define the operational profile in agreement with the owner. Definition is based on owner's input from similar vessels operating the same routes or for the intended route with an anticipated profile.
STEP 03	Evaluate the ideal propeller characteristics for the hull form based on the main engine selection. This iterative task, in most cases, requires matching different propellers to different engines, depending on the availability of engines in the selected range and their engine load diagram, e.g., power, torque, and Specific Fuel Oil Consumption (SFOC) versus Revolutions per Minute (RPM).

vessel. If relevant, especially in retrofit projects, ABS can also provide techno-economic analysis where, for example, the return on investment can be evaluated for the operational profile investigated.

To benefit most from these hydro-dynamic evaluation services, it is important to engage ABS early in the design phase of a new construction/retrofit project. At the early stages there are usually less design restrictions and costs related to any eventual design changes.

The ABS Energy Efficiency team is multidisciplinary, with extensive experience in ship hydrodynamics, numerical modeling, model testing, full scale measurements, design, ship management and operations and regulatory compliance. Each service builds upon the ABS position as a leading provider of classification and regulatory compliance services, and seeks to further our mission of protecting life, property and the environment. Leveraging extensive experience and knowledge enables ABS to provide detailed and in-depth recommendations supported by advanced tools to help owners and operators meet their operational and regulatory needs.

Main Engine Technology Applications: Regulatory Compliance and Fuel Efficient Operations



STEP 04

Once the initial propeller diameter and main engine RPM are set and the propeller vendor(s) have provided a design proposal for the propeller, ABS will model the hull and propeller using CFD tools and perform simulations for a number of points in the operational profile.

It is common that several propeller designs are evaluated to find the optimal solution.

STEP 05

Conduct model test planning and evaluation of results, if required.

For additional information on ABS' Energy Efficiency services, please contact us at: energyefficiency@eagle.org

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