MARIN has been privileged to contribute to an innovative cruise ferry project that shows the value of good collaboration between the owner Color Line, shipyard Aker Finnyards and suppliers. Report outlines this interesting project.

An example of a successful joint project

Color Fantasy

In 2005, the 'Color Fantasy', the only cruise-class liner with car decks, entered a daily service between Kiel and Oslo and in 2007, 'Color Magic' will follow.

As part of the development of this innovative cruise ferry, MARIN was requested to optimise and assess the hydromechanical ship design, while particularly taking the exceptionally high comfort class, safety and economical requirements, into consideration.

Hull lines supplied by Aker Finnyards were evaluated by MARIN using its CFD tools and expertise and all of the hydrodynamic design issues were addressed. The optimised hull-shape, with modified bulbous bow and aft body buttocks with faired trim wedge, was found to be much better in resistance than comparable cruise vessels. In addition to the hull form improvement by numerical means, Color Line requested an experimental optimisation adopting a step-by-step approach. The design optimisation steps amounted to considerable efficiency and comfort improvements, resulting in a further power reduction of 8%.

Several propeller designs were thoroughly investigated. MARIN's Depressurised Towing Tank proved to be the perfect facility to test the ship model with Rolls Royce-designed propellers, on cavitation and induced pressure fluctuations. In order to carefully study the tip vortex and the risk for broadband excitations, the state-of-the-art technique of high-speed video observation was used.

MARIN's service-based design approach drove further numerical evaluations. Route-specific simulations were conducted (by means of GULLIVER) and demonstrated the reliability of the service, the comfort levels of the passengers and crew, in terms of seasickness and human mobility and on ship safety, including aspects such as parametric roll. The fit-for-purpose for harbour operability was evaluated relating to the set design criterion.

A very accurate simulation model was based on PMM experiments assessing the transit course-keeping characteristics and manoeuvring capabilities in normal and safety scenarios. This simulation model was also used for crew training.

There is no better proof of the success of the project than the ship itself. "Color Fantasy" has met the owner's requirements. The vessel meets the high comfort levels and has shown that the harbour and transit manoeuvring characteristics were optimal and well predicted. All of the partners concluded that good cooperation and the use of very modern measuring and calculation techniques are absolutely necessary in such a project.

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