

Courtesy Vripack

Patrick Hooijmans
p.m.hooijmans@marin.nl

MY Wheels - An expedition through MARIN's services

For the 50m expedition vessel MY Wheels, MARIN assisted its designer Vripack® with design consultancy and model testing. Work focused on propulsive efficiency, comfort, controllability and safety during transit and low speed operations. Report outlines the work.

By means of CFD calculations the hull lines have been optimised in order to minimise the wave resistance. And this took into account typical yacht restrictions concerning anchor handling, aesthetics, as well as bow and aftbody slamming. This optimisation led to an approximate 10% reduction in wave resistance, representing about 6% of total resistance.

A trim wedge has been optimised to reduce the required shaft power. A power reduction of about 5% was achieved and this reduced the risk of aftbody slamming due to increased transom immersion.

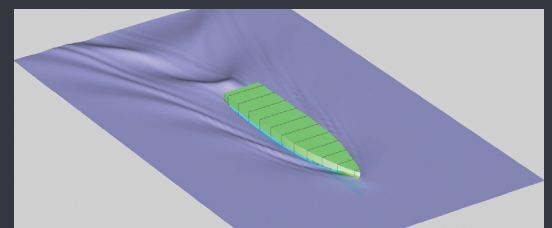
Comfort

Ship motions, vibrations and related seasickness are a direct aspect of concern for passengers and crew. Consequently, this is a strong focus point in the design process. MARIN was consulted to optimise the hull form to avoid vibrations (aft and bow slamming) and to evaluate the roll response with active fin stabilisers. Model tests conducted were dedicated to the anchored condition in a swell like environment, triggering a resonant roll response. A realistic sea environment was mimicked to evaluate comfort levels during transit.

Controllability and safety

Good controllability of the yacht is required in both an offshore environment and in confined and congested waters. The active steering and roll stabilisation

systems are dedicated to ensure a safe and efficient passage. The displacement in combination with the yacht length may, in some extreme cases, yield to relatively strong rolling in stern-quartering seas and poor course-keeping ability. In extreme conditions the risk of green water, bow flare slamming, course-keeping ability and the risk of broaching are becoming relatively important. Both the controllability and the safety aspects have been addressed in the design feedback and verified with care by modelling the vessel with active steering and fin stabilisers, while mimicking the real



Predicted wave pattern.

offshore sea climate. Special attention was paid to the controllability of the vessel when sailing astern in typical low speed harbour conditions.

During the entire hydrodynamic design process, the focus was to fit the yacht for purpose as an expedition vessel. This meant that a close cooperation between Vripack® and MARIN was vital to meet these requirements. After the tests we can say that we succeeded and that the yacht owner can be confident that his vessel can sail freely and safely and that it will also be comfortable and be able to realise the required range and speed.

MARIN