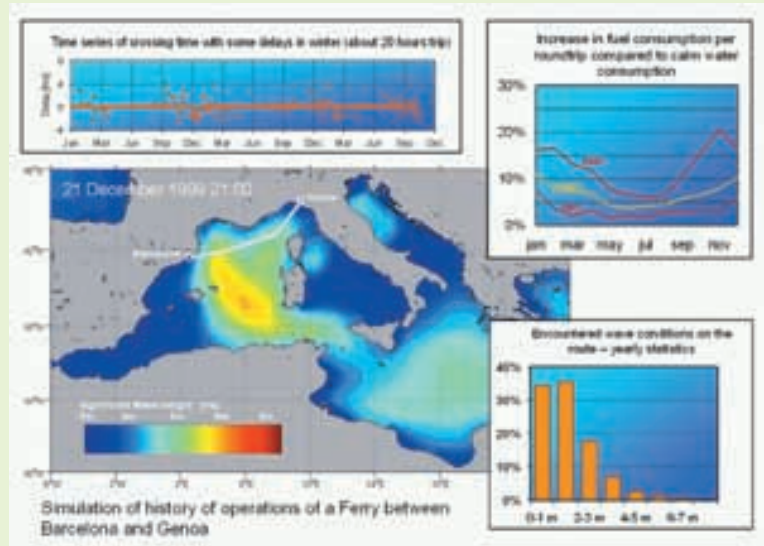


Within the realm of safety, the shipping industry is continuously searching for a competitive balance between operational performance and building costs. Report highlights how MARIN helps the industry with this complicated problem.



Scenario simulations for profitable shipping

MARIN has developed scenario simulation methodology to quantify the balance between investments, operational revenues and costs. In these simulations several years of operational service are mimicked, taking into account the weather on the route. A key element in this analysis is the way the master handles the ship in adverse weather; prudent seamanship (risk-avoidance) and the impact of speed and reliability on short-term revenue.

Most of the simulations that have been carried out are in the field of design verification or concept development. The first work performed was in 2001 for the Queen Mary 2. This addressed the issue of the required service margin needed to obtain a reliable transatlantic service.

A very recent example was a contract to quantify the impact of adverse weather on the logistics operations of Airbus A380 airplane parts, which are transported by a specially-designed ro-ro carrier between manufacturing sites in Europe.

Model tests were used to determine factors such as the sustained speed and this was then used to estimate the reliability of sea transport in the Airbus logistic chain. The relationship between the encountered sea state and the risk of whipping and local accelerations on the cargo were obtained by

tests using a flexible segmented model. Scenario simulations that covered several years of service were carried out. These then provided a solid basis for determining the likelihood of encountering extreme accelerations that may damage cargo.

In the area of concept development, MARIN investigated the reliability of a new inland/short-sea concept within the European project InterModeShip. Issues examined included the trip duration and reliability, fuel consumption and extreme behaviour.

Opportunities

Voyage simulations also offer opportunities in the field of fleet development. What would be the most efficient round-trip schedule and which (charter) vessel had the lowest fuel consumption, were some of the many questions answered by simulation studies.

Performing simulations at an early stage of the development of a design, enables shipyards and shipowners to get a detailed assessment. There is clearly a lot to gain from a preliminary evaluation of the future operational performance of a ship. But simulations need to be done at the preliminary stage in order to yield the right choices at the right moment.

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