



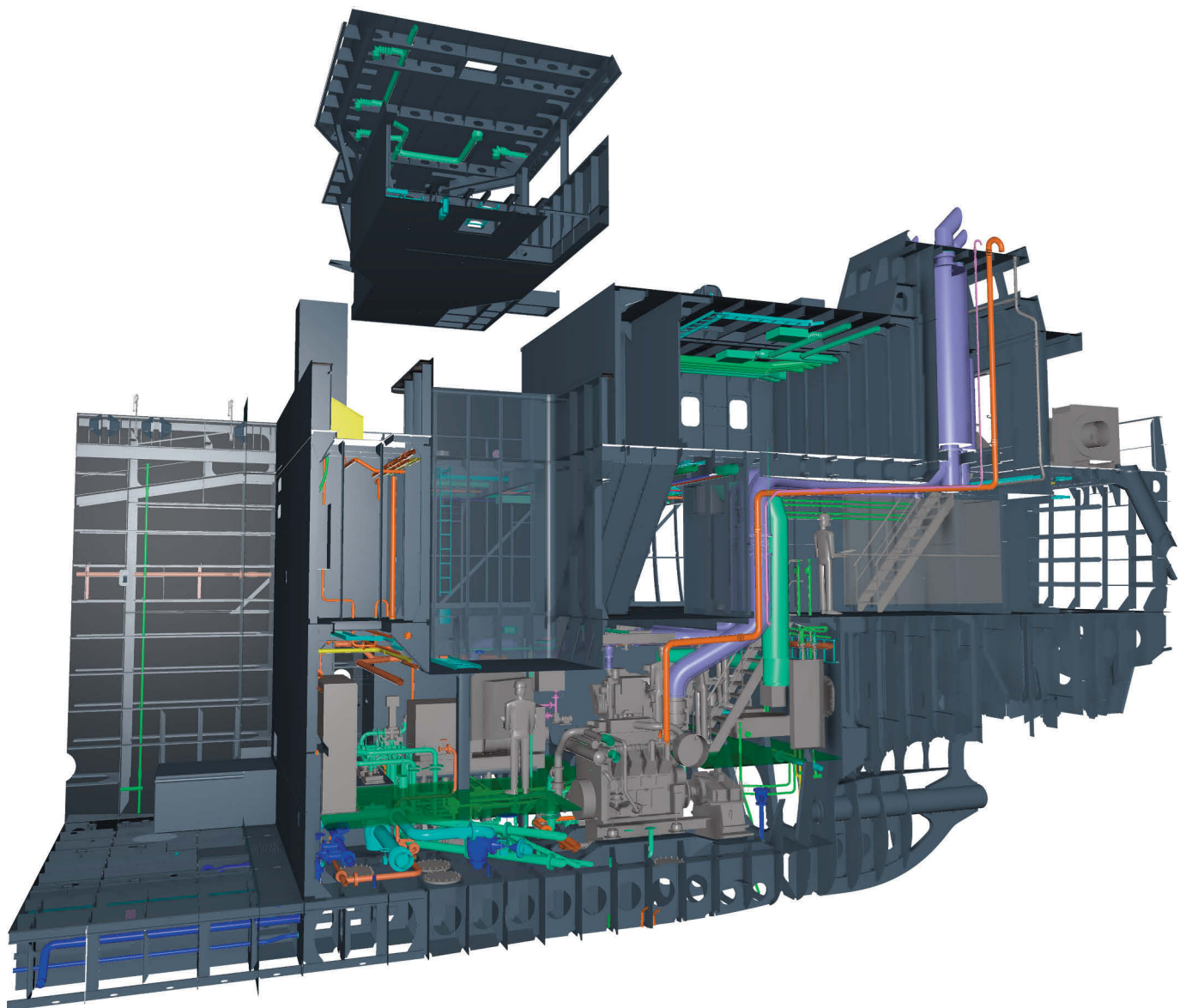
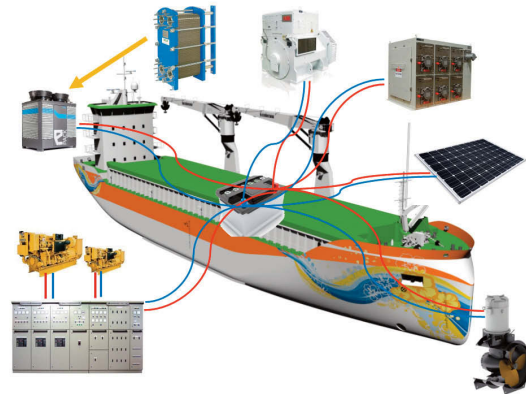
GROOT SHIP DESIGN

New tonnage for short-sea shipping The integral design approach



Recent market conditions have changed the way ships are designed. Whereas in the past standard off the shelf design would have sufficed, today's market situation, with its low freight rates and increasingly stringent environmental regulations, is pushing the design of more efficient ships to a new level. Groot Ship Design differentiates themselves in its design approach by combining all disciplines right from the start, thus creating higher efficiency levels in propulsion, fuel consumption, and cargo intake and handling.

A vessel is often viewed as the combination of its separate parts. Consisting of a hull, a main propulsion system, electrical power generation, and all other necessary systems, each part comes with its own challenges and specialist requirements. In a big jigsaw puzzle like this, the pieces might not always fit very snugly. This approach has worked for many years, and to this day it is common practice still. In order to create more efficient ships, though, Groot Ship Design has opted for an integral approach. Vast in-company knowledge and capable in-house specialists on almost every aspect of the vessel have made it possible to integrate all disciplines from start to finish, resulting in designs where efficiency exceeds all existing standards. Naval Architecture, System Design, CFD, Propulsion, Construction Design – they are all connected.



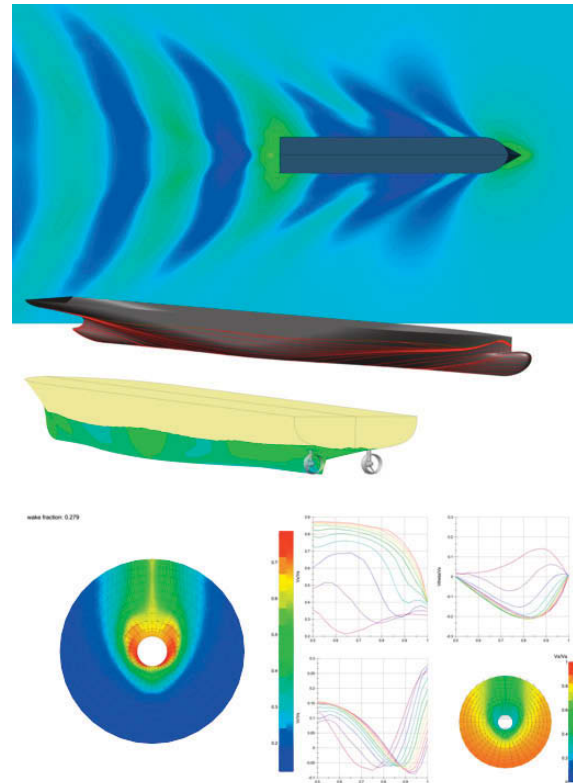
By eliminating the cracks between the pieces of the puzzle, by minimizing the traditional margins using enhanced calculation and cooperation methods, designs can now be improved and optimised better than ever before.

Philosophy

“Our cement carrier designs demonstrate the outcomes of this philosophy”, says Jan Willem Cuperus, managing director of Groot Ship Design. “Previously, a regular vessel of this type would sail into port, turn off its main engine and start up its generators for the offloading process. With our current vessels we can generate the power for the offloading process off the main engine, which has a lower fuel consumption compared to gensets. There are numerous advantages for the use of a combined power generation and management system, choosing the most suitable cement handling system and working with sophisticated heat recovery systems.

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This not only lowers the Capex. Having less machinery also means fewer spares, less weight, less personnel training, and therefore a lower total cost of ownership. These effects can make or break the profitability of a vessel.” Other examples would be the more common vessels in the large fleet of multipurpose and short sea vessels. “We seek the optimal configuration in propulsion and power generation, taking the entire operational profile of the vessel as specified by the owner into consideration. We then provide different options for power generation and propulsion. Recently, we conducted



a study for a short sea vessel comparing diesel direct, diesel electric and hybrid propulsion. The owner has picked the ideal configuration and is now finalising the negotiations with the shipyard.”

The integral design approach resulted also in a new design for shipowner Briese. Who ordered a 5000 DWT Open Top MPV. Owner’s demands in cargo capacity, intake, low consumption and emissions



- were considered in the design process resulting in one of the most economical MPV designs on the market today. The Briese design includes an update of the well-known Groot Cross-Bow®, further developed to operate and excel in difficult ice conditions (the vessels include Finnish-Swedish ice class 1A); and the crew accommodation superstructure design is integrated in the fore ship. Initially, the series consisted of an order of four, but as the owner was greatly satisfied with the vessel's results and its performance, the decision to order four more, soon followed. At this moment vessel number 4 is close to delivery.

Brighter future

"Recently, ship owners are increasingly interested in multipurpose vessels and short-sea vessels ranging from 3000 to 7500 DWT. Leading ship owners are in advanced stages of decision making regarding new tonnage, with the smaller shipping companies following them closely in their wake." After almost a decade of hard work and little reward, the future looks brighter today. Shipping companies and owners are making up their minds on how to deal with the aging fleet of multipurpose and short-sea vessels; ideally by replacing them with improved and efficient designs that are well suited for the next decades in shipping.

