Cutting-edge Diamond makes leap from drawingboard to operation

A raft of regulatory developments and the rapidly evolving needs and expectations of the client markets have created new challenges in ship design. New demands, though, have presented wider opportunities for both the marine technical and ship operating communities to demonstrate the industry's capacity for innovation. David Tinsley reports - Tuesday 3 April 2007

AS a prime example of innovative thinking in bulker design, the Diamond concept has been developed with the central consideration of the long-term operational needs of owners and charterers, complemented by the philosophy of closely-superintended volume or batch newbuild production in keenly cost-competitive areas.

The approach fostered by the Cardiff-based Graig Group has been vindicated by the very substantial uptake of the design type in its handymax form among operators and investors worldwide.

Now the concept is set to make its operational debut in the handysize market, with the first of the Diamond 34 breed expected to be delivered from Vietnam later this year.

Nine such examples of the doubled-hulled, geared 34,000 dwt design have been contracted from Pha Rung Shipyard, in Haiphong.

A number of privately-owned Italian bulkship specialists are committed to the first five newbuilds at least. Graig Investments has subsequently expanded its sourcing of such tonnage by awarding a firm order for two Diamond 34s to China's Haida yard.

Similar technical and project templates to those employed for the 54,000 dwt double-hull Diamond 53 bulker have been adopted in the development of the 34,000 dwt version. As with the handymax bulker, the Diamond 34 is a product of the collaboration between the Cardiff-based Graig Group and the Danish design consultancy Carl Bro Marine. Tenets of the technical approach have been design strength, efficiency and flexibility of operation, cargo friendliness, ease of maintenance, manoeuvrability and shallow-draught. Det Norske Veritas has had a direct input to the Diamond technical development programme on structural and regulatory issues.

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Despite the absence of any mandatory requirement for double-hulling in bulk carriers, as had seemed to be in prospect when the handymax was under development, the scale of the market uptake of Diamond bulkers reflects operators' appreciation of the range of practical advantages conferred by the design type.

The adoption of a double hull in the 34,000-tonner, as in the handymax type, contributes fundamentally to the robustness of the design, and provides a secondary barrier to accidental water ingress. The double side skin also ensures safe access for close-up survey of the complete hull structure, even when the vessel is loaded. By comparison with a standard handysize bulker, where the side shell structure is based on a single skin, the Diamond's double hull configuration enables the longitudinal framing to be incorporated within the inter-shell spaces.

This dispenses with exposed side frames in the cargo holds, leaving flush surfaces throughout, increasing the efficiency of cargo discharge and hold cleaning, and reducing inspection and maintenance costs.

Particularly large hatch openings and the absence of lower hopper side tanks in holds 2, 3 and 4 contribute to the cargo-friendly qualities of the 34,000 dwt design, which incorporates four heavy-duty deck cranes.

The bulker is suited to all the most widely-traded commodities including coal, grain, ore, cement, alumina, bauxite, mineral sand, fertiliser, steel products, scrap iron, logs, and packaged timber, as well as certain dangerous cargoes. An important trading feature of the class is its relatively shallow draught.

Typical loading conditions could include a heavy grain or heavy ore cargo deadweight of 32,200t, with a potential 1,800t non-cargo departure deadweight, at the 9.75 m scantling draught, and with holds 2 and 4 empty in the case of ore.

Due to the increased tanktop strength, the Diamond bulker will be able to stow up to two tiers of 20t steel coils of 1.5 m length on timber dunnage across all holds, providing a full coil cargo carrying capability.

The strengthening of the tanktop structure also offers better long-term protection against the rigours of grab discharge, which can take a heavy toll on the holds of most bulkers over the years. The 45,500 cu m of underdeck volume is complemented by the revenue-earning capabilities offered by the weatherdeck, in terms of shipments of logs and packaged timber.

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Although the new handysize bulker has been designed to take water ballast in No3 hold, an expedient when sailing unladen in heavy weather, the ship's normal ballast condition does not require the hold to be flooded, and all ballast can be sequentially exchanged at sea.

The main engine is a six-cylinder S46MC-C MAN diesel, rated at 7,600 kW for a service speed of 14 knots. As in the Diamond 53, the heavy fuel oil tanks of the handysize ship are protectively located behind outer cofferdams in the engine room.

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