



Carl Bro Newsletter Marine

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Arrangement of new crane winch room for Maersk Achiever

Transformation to deep-sea crane vessel

Mærsk requires two vessels that can lower 200 tonnes unit weight of heavy oil drilling equipment down to a depth of 2,500 metres and has asked Carl Bro Marine to assist in the conversion of two anchor handling vessels.

Because oil exploration is carried out at increasing water depths, such as off the Brazilian or West African coasts, two of Mærsk's anchor handling vessels, the Achiever and the Attender, both built at Volkswerft Stralsund, are soon to be transformed into deep-sea crane vessels with an operational depth reaching down to 2,500 metres.

The two 250 ton heavy lift marine cranes have been ordered and are being built at Hydramarin in Kristiansand. The first crane will be delivered at the end of the year to the Mærsk Achiever, which is due for its trail test in the North Atlantic in the first quarter of 2006.

Immediately after this the Mærsk Attender is due for the same procedure.

Advanced heave compensation

The crane layout is divided into one upper deck visible knuckle beam and slewing part and a lower deck installed main winch and spooling device with a 125 ton wire 100 millimetres in diameter.

The winch is effectively heave-compensated down to 2,500 metres with 200 tons payload in the hook. Compensation takes place by means of a nitrogen oil cylinder accumulator that acts directly on the winch's hydraulic motor.

After evaluation of the stability in connection with the crane operation, Carl Bro Marine has turned the focus on detail engineering where approximately 15 metres of the hull is changed from the cargo tanks to the crane winch room.

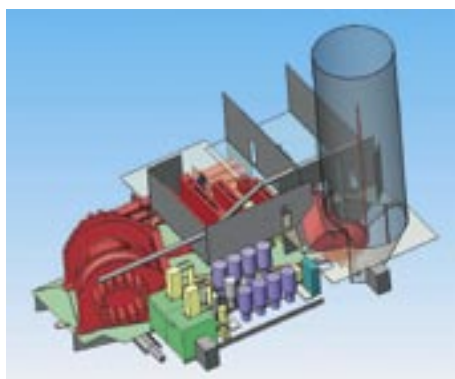
The many components that have to work together in a confined space under the deck have made it necessary to build up the construction in a 3D CAD

system in order to check clearance of the wire, passageways and access for maintenance.

A tank heeling system will be installed in order to keep narrow heeling tolerance during lifting operations.

In addition to this, the accommodation space will be extended for sixteen extra people due to the increased manning requirement for crane operation.

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EDITORIAL



High level of activity

Like most of our customers, and the marine business in general, we too experience a continuous high level of activity.

Fortunately, we are already established in the Far East, and several Carl Bro Marine designs have materialized at shipyards in China, Vietnam and India in recent years. Hence, we are in a position where we can offer other services to our customers in addition to design that are based on our experience and market knowledge.

Every day we are challenged by our customers with regard to technological advances, latest trends and our experience and because of this Carl Bro Marine needs to ensure that we always have a team of highly skilled employees at hand. We have recently employed graduated naval architects and engineers in order to ensure that we can continue to deliver the required services to our customers, now and in the future.

The Diamond 53 bulk carriers are still a success, and we are pleased to announce that they have reached the Indian market and will be built at Hindustan Shipyard.

Furthermore, we are pleased to introduce 'the next Diamond', a 34,000 dwt bulk carrier to the market.

Besides ship design we are also involved in inspection and surveys. We intend to intensify our activities in this field as we believe that 'hands on' experience can be transferred to our design knowledge.

In this newsletter we have described some of the projects we have been, or are, involved with this year. We do hope you find it interesting and that it reflects some of your requirements. We shall be pleased to offer our services.

Kind regards

Kim Bomholt Nielsen
Director, Carl Bro Marine

Increased focus on CAP

To an increasing extent, Carl Bro Marine is applying its long experience of ultrasonic thickness measurements for processing and co-ordinating CAP surveys.

Carl Bro Marine is approved by LRS, DnV, GL and BV to carry out ultrasonic thickness measurements (UTM) of ships, and over a number of years the company has carried out thickness measurements for special surveys.

"The experience and expertise we have accumulated from carrying out and co-ordinating thickness measurements benefit our customers when processing the very demanding CAP surveys," says Kasper Bøgh Pedersen who has recently processed a docking specification for a Carl Bro customer based on 18,000 thickness measurements taken in connection with a CAP survey.

Carl Bro Marine can handle the entire steel structure part of the CAP survey or just supervise and co-ordinate parts of the task. For example, we can be responsible for contacting and monitoring UTM technicians, we can communicate with the Classification Company, and we can prepare docking specifications.



The Condition Assessment Programme

Major oil tanker charterers require an independent evaluation of the chartered ship's condition to ensure it meets recognized standards of quality. For this purpose the CAP (Condition Assessment Programme) is introduced as a voluntary supplement to classification.

There are four CAP ratings, but only CAP1 and CAP2 are of interest to tank shipping companies.

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New handysize Diamonds

Carl Bro has launched a unique double-hull handysize bulk carrier design, Diamond 34, and already the Graig Group has contracted four Carl Bro-designed Diamond 34 bulkers, with four options, to be built in Vietnam at Vinashin's Pha Rung Shipyard. Delivery dates begin in mid 2007.

Hugh Williams, CEO of Graig, says, "This expansion of the Diamond concept into a new size range makes all the proven success factors of the Diamond available to handysize operators. We have had excellent feedback from the five Diamond 53s already delivered, and Carl Bro Marine has developed this new Diamond 34 based on the same concepts."



The Diamond 34 is a 34,000 dwt handysize geared five hatch double-hull bulk carrier which builds on the success of the Diamond 53 double-hull handy-max design.

The development of the Diamond 34 design is focussed on:

- Economical operation / maintenance
- Environmental friendliness
- Loading flexibility and robustness
- Future regulations for bulk carriers
- Safety

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PRINCIPAL DIMENSIONS (ALL APPROX.)

• Length oa., max.	180.00 m
• Length pp.	172.00 m
• Breadth moulded, max.	30.00 m
• Depth moulded	14.70 m
• Scantling draught	9.75 m
• Cargo hold cubic (grain)	45,500 m ³
• Deadweight	34,000 t

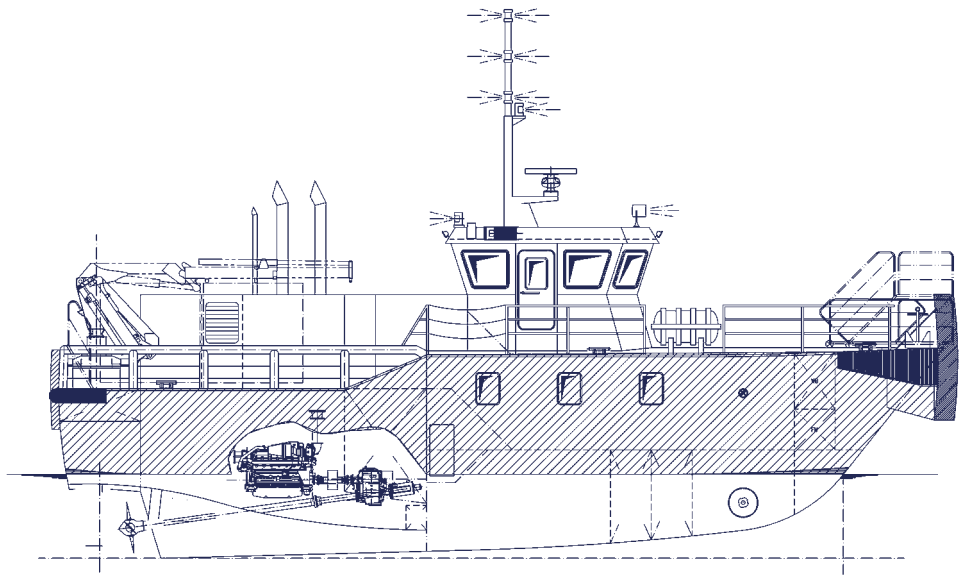
New service boat for offshore wind farm

Carl Bro Marine has designed a new service vessel for accessing Energi E2's offshore wind farm off Nysted. Landing of personnel can be carried out in waves up to two metres high.

Experience with the present service vessels at Nysted offshore wind farm just south of Gedser shows that these are not optimal with regard to their main function, which is access for service engineers to the various wind platforms.

Service vessels should be able to operate optimally in a significant wave height of up to two metres, which is not the case now.

For this reason, in the spring of 2005 Energi E2 gave Carl Bro Marine the task of finding out which types of ships would be best suited for the operation with a view to subsequently preparing tender documents.



Bollard pull of 15 tons

The result of Carl Bro Marine's preliminary investigation and subsequent ship design is now in the form of a 22-metre long vessel, equipped with two 800 KW diesel engines driving two CP propellers with a top speed of around 19 knots.

The service vessel is designed to be operated by two people.

There is accommodation for 24 day passengers, and a working deck with a cargo rail and a 20-ton

metre marine crane for landing equipment onto wind platforms.

Access for service engineers takes place over the stem with a 'bollard push' of approximately 15 tons, which is necessary to hold the stem against the support structure in a significant wave height of up to two metres.

The fender system is adapted for the concrete base structure of the turbine towers with height variable platforms to compensate for the tide.

Advice sought from the user

The development of the vessel took place in close collaboration with local operators. This has made it possible to incorporate many functions into a simple and maintenance-friendly design with due consideration to environmental aspects, for example an oil spillage secured bunker system.

The vessel is built in aluminium reinforced for operating in Danish ice winters.

MORE INFORMATION

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India to build Diamond 53

India is on its way back to becoming an appealing shipbuilding nation and Carl Bro Marine is looking forward to gaining experience from its new venture with Goodearth Maritime and Hindustan Shipyard in India.

Goodearth Maritime Ltd, the Indian operator, which is part of a major trade conglomerate, is seeking to make its presence felt more on the bulk carrier market and has ordered six Diamond 53 bulk carriers to be built at Hindustan Shipyard Ltd in India.

Carl Bro Marine is to manage the design together with Hindustan Shipyard Ltd and is thus looking forward to being able to amass invaluable experience with Indian shipbuilding which is on its way back into the international arena.

New country, new procedures

"The long delivery deadlines from the Chinese shipyards have resulted in interest in countries such as India and Vietnam", says Niels Agner Jensen from Carl Bro.

"We have already built up valuable experience in China and Vietnam and believe that coming to India and getting to grips with the way things are done there is beneficial to our customers.

It is always different to go out and build in another country and we need to gain as much experience as possible to get everything on the right track".

For some time Carl Bro Marine has been sending out drawings for approval and the shipyard is due to cut steel according to plan at the beginning of December. The first ship in the series is due for delivery in 2007.



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INFO

How to build a Bulk Carrier

Carl Bro Marine has supported BIMCO by writing the **BULK CARRIER Specification Guidance and Review Guide**. The guide is intended as assistance or a tool for owners who have not had any experience with staff employed to draw up specifications, prepare contracts, tender processes etc.

Carl Bro Marine's Finn Ole Boye has written a detailed manual for BIMCO (the Baltic and International Marine Council) to help small shipping companies and management firms wishing to build bulk carriers

The BULK CARRIER Specification Guidance and Review Guide, which is the first of its kind on the

market, has been reviewed and approved by BIMCO's technical committee in Greece.

Finn Ole Boye describes this work as a textbook and a tool that guides the reader through the whole process from start to finish by providing theoretical and practical examples: - How do you get going? - What are the requirements? - Where are the pitfalls? - What actually happens during the building process? - Who has responsibility? and so on.

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Tanker innovation under way

Increasing demand and forthcoming amendments to regulations governing different types of cargo have led Carl Bro Marine to set about streamlining and itemising a new tanker design.

By setting resources aside and making use of valuable inspiration gained from the successful Diamond 53 project, Carl Bro Marine is now initiating the design and the specification phase of a new product tanker.

Carl Bro will use exclusively in-house resources for the initial phases which are due to be complete at the end of the year when Carl Bro Marine will make a presentation of the project. The aim of the presentation is primarily to find the way to larger ship owners or shipyards who are interested in participating in further development.

Design and safety

Carl Bro believes that within the IMO 2 product range there is an in particular unfulfilled requirement and that product tankers' deadweight capacity will be between 40–55,000 tons.

"We will create a new tanker in which design, effect and safety requirements interplay optimally, and although we will make use of the experience we have built up in the company, all practical input is essential and necessary. Particularly now in the introductory phase we are open to suggestions," says Peter Smith Bendtsen, who is acting as project manager.

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Carl Bro Marine is a division in the internationally oriented consultancy company Carl Bro Group. We are located near Copenhagen, Denmark, and we offer all kinds of services related to the marine sector.