



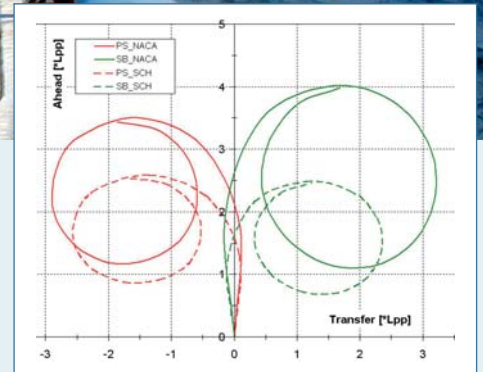
## High-lift rudder increases ship safety

IMPROVED MANOEUVRABILITY AS A VALUABLE CONTRIBUTION TO THE ENVIRONMENT



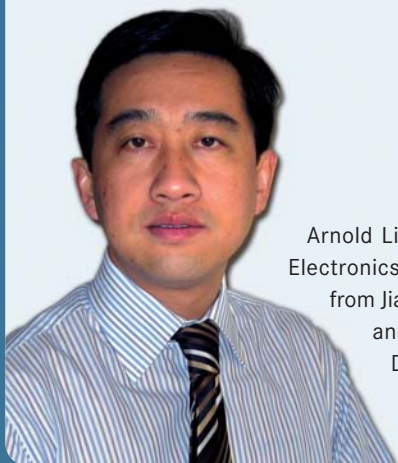
Environmental aspects have become more and more relevant for the shipbuilding industry. Safety is a top priority for ships carrying dangerous cargo like tankers, bulkers and container vessels which would seriously harm the environment in the case of a shipping accident. In a calm and open sea almost any kind of rudder ensures course-keeping of the vessel. However, the same ship in restricted waterways, at slower speed, with traffic, strong wind and shallow water effect will show a much more critical behavior. In these conditions, a high-lift rudder would be the captain's choice to ensure the safety of the ship.

The results of the high-lift rudder retrofit of the 75,000 dwt bulk carrier "Atlantic Eagle" illustrate the improvements in the vessel's manoeuvrability. She lost her semi-spade rudder due to a grounding. The rudder was replaced by a full spade Schilling® Monovec Rudder with about 20% less movable area. A short replacement time occurred due to the rudder being taken out of running production. Turning circle trials demonstrated the reduction of the advance from 4.0 L (ship lengths) to 2.5 L to starboard and from 3.5 L to 2.5 L to port side. The benefits for low speed manoeuvring were observed to be just as impressive.



Turning circle, full scale trials "Atlantic Eagle"

With Becker's KSR rudder support technology, such a Schilling® full spade rudder can be built up to unlimited size, ensuring a reliable and safe solution for even the biggest VLCCs.



### Becker staff member: **Arnold Li (Li Qiang)**

BMS CHINA – SALES DIRECTOR (AND MORE!)

Arnold Li graduated in 1987 as an Electronics & Automation Engineer from Jiangsu University of Science and Technology in China. During several steps in his career he built out his

experience in the shipbuilding industry first in the design department of Jinling shipyard and later as Senior Sales Manager of a German company. In 2007 Mr. Li joined our team of Becker Marine Systems as Sales Director of

our Chinese office in Shanghai. Becker appreciates his sound experience and knowledge of the maritime business that make Mr. Li a highly skilled and professional contact for our valued Chinese customers.



## “Carnival Dream”: Outperforming podded cruise vessels

ONE OF THE WORLD’S LARGEST CRUISE SHIP FITTED WITH TLFKSR TWISTED FLAP RUDDERS



In September 2009 Carnival Cruises launched its new cruise vessel “Carnival Dream”. The ship was constructed at Fincantieri shipyard in Monfalcone, Italy, to be the biggest vessel of Carnival Cruises. The 130,000 t ship has a length of 306.0 m and accommodates 3,646 passengers. As of November the vessel will start its regular route to the Caribbean. But before the “Carnival Dream”

leaves on the transatlantic cruise to her main port in Port Canaveral, Florida, two journeys to the Mediterranean Sea are on her schedule.

The hydrodynamic design of the “Carnival Dream” started about

four years earlier with extensive CFD research and model tank testing. The design was presented in the September 2007 issue of “The Naval Architect” as a new concept providing equivalent or better hydrodynamic performance than passenger vessels with podded drives. Sea trials have now confirmed the tank test results which prove that this new generation of conventional vessel has

the chance to compete in terms of fuel consumption and comfort with the best podded ships.

Becker Marine Systems is proud to have contributed to this masterpiece of hydrodynamic engineering with a pair of Becker TLFKSR Twisted Flap Rudders of 26.0 m<sup>2</sup> each to provide the “Carnival Dream” with excellent manoeuvrability and smooth course keeping with only a few tenths of a degree of rudder angle.



Becker's TLFKSR (as fitted to cruise ship “MSC Fantasia”)

## “Motorway of the Sea”: On the fast lane with Becker rudders

FINNLINE CONNECTS GERMANY, POLAND AND FINLAND WITH HIGH SPEED FERRY LINKS

In early June 2009 the leading shipping operator Finnlines initiated its “Motorway of the Sea” for freight and passengers between Germany, Poland and Finland. The new “Motorway” connects the ports Travemünde, Gdynia and Helsinki and transports passengers and freight in every direction in three weekly departures. On board of the Finnline fleet the passengers have the possibility to travel to Gdynia in less than 19 hours and from there to Helsinki in further 15 hours.

The vessels “Finnstar”, “Finnmaid”, “Finnlady”, “Europolink” and “Nordlink” are the world’s largest Ro/Ro passenger ferries in their class. The sister vessels have a length of 218.8 m, a breadth of 30.5 m and a draught of nearly 7.0 m. With a capacity of 4,200 loading meters the “Star-Class” vessels can transport rolling cargo like trucks or busses and 110 cars.

The main advantage of the “Motorway of the Sea” is a relief of the traffic volume on European highways, resulting in a significant reduction of vehicle related CO<sub>2</sub> emissions and an improvement of safety on the roads due to less traffic.

Becker Marine Systems is very proud that all of Finnline’s five “Motorway” ferries are fitted with



Becker’s TLFKSR Twisted Flap Rudders. The 17.5 m<sup>2</sup> rudders of the vessels are especially suitable for these fast applications, offering best manoeuvring performance and reducing the fuel

consumption of the vessels. That is how Becker Marine Systems proudly contributes its part to make the idea of a “Motorway of the Sea” an environmentally friendly success.

## Order highlights: Becker Marine Systems products

### DINGHENG SHIPYARD

In August the German based Essberger GmbH & Co. has ordered two 8,500 dwt Oil/Chemical Tankers at the Chinese Dingheng Shipyard. Becker Marine Systems entered the contract with the delivery of 13.1 m Heracles Rudder systems which ensure excellent manoeuvring performance together with economic benefits. The vessels with the ice class E3 (A1) have a length of 120.0 m, a breadth of 18.5 m and a draught of 7.5 m. The tankers are classified by Germanischer Lloyd and will be delivered in 2010.



### DALIAN SHIPBUILDING

Pacific International Lines (PIL) Ltd. in Singapore has signed contracts with the Chinese Dalian Shipbuilding Industry Cooperation for the construction of a series of four 6,600 TEU container vessels. The LRS classed vessels have a length of 300.0 m, a beam of 40.0 m and a draught of 14.5 m. To provide the container vessels with the best possible manoeuvrability each newbuilding will be equipped with a 58.6 m<sup>2</sup> TLKSR® Twisted Rudder with Vortex-B-Deflector. Deliveries are scheduled for the end of 2010.



### PEENE-WERFT



The Swedish Coast Guard has ordered four vessels at the German Peene-Werft GmbH. The Multi-Purpose vessels have a length of 52.0 m, a breadth of 10.4 m and a draught of 4.0 m. The main mission of these vessels is environmental protection and they shall also have capabilities for patrol activities, lifesaving missions, emergency towing and fire fighting at sea.

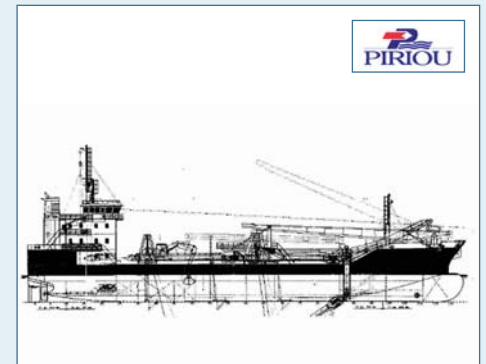
The vessels will each be equipped with two full balanced spade rudders of Becker Marine Systems high-lift flap type. With a rudder area of 2.0 m<sup>2</sup> the Becker FKSR Rudders guarantee the best possible manoeuvrability for the ships at all speeds with the lowest possible fuel consumption. The vessels will enter service between 2011 and 2012.



### CHANTIERS PIRIOU

Becker Marine Systems received a new order from the French shipbuilder Chantiers Piriou for two 5.4 m<sup>2</sup> Becker full spade NACA profile rudders. The miscellaneous vessel will be built for the shipowner Compagnie Européenne de Transports de l'Atlantique (C.E.T.R.A.) and will be delivered at the beginning of 2010. The hopper dredger has a length of 85.0 m, a breadth of 16.0 m and a draught of 6.0 m.

Since the rudders will be extremely stressed by the rough conditions during the dredging, the shipyard and the owner trust in a proven Becker rudder design to guarantee a reliable manoeuvring solution for these working conditions.



### COSCO SHIPYARD

Early this year, the Chinese Cosco Shipyard in Nantong received an order from the Danish Lauritzen Tankers A/S for two shuttle tankers. The 59,000 dwt vessels have a length of 207.0 m, a breadth of 32.2 m and a draught of 13.5 m. To improve the manoeuvrability and the course-keeping both vessels will be equipped with Becker's Schilling® KSR Rudders. The rudders combine the high performance Schilling® rudder profile with the KSR (King Size Rudder) support and are the ideal choice for large tankers and bulkers. The delivery is scheduled for 2010.



Lauritzen shuttle tanker "Dan Eagle", 2008  
Picture courtesy of Lauritzen Tanker A/S



## Historic Ship: "Isle of Mull"



The ferry "Isle of Mull" entered service in April 1988 and was built at the Port Glasgow for the Scottish owner Caledonian MacBrayne. The ferry operates for more than 20 years now on

its route between Oban and Craignure on the Isle of Mull. Shortly after the launch the owner noticed that the "Isle of Mull" needs further capacity to accommodate more freight. So only a few months after the maiden voyage the ferry was taken out of service to be lengthened by 5.4 m. Now the "Isle of Mull" has a capacity of 80 cars and nearly 1,000 passengers. The ferry is equipped

with a Becker Flap Rudder FKSR which provides the best possible manoeuvrability for the faithful ferry with lowest possible fuel consumption. No wonder that the "Isle of Mull" completes the route in just under 40 minutes.

"ISLE OF MULL"	
Length (loa).....	90.30 m
Breadth.....	15.80 m
Draught.....	3.19 m
Gross Tonnage.....	4,719 GT
Service speed.....	15.0 kn

## Becker's Service Offer: We get the most out of your ship

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- Retrofits
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## New: Becker Marine Systems goes to Korea



To further improve its position on the Korean market Becker Marine Systems has opened a new office in Busan to provide technical support to our local agent BV Korea and improve the communication with our Korean customers. The close relationship to the world's biggest shipyards will be further enhanced by our local customer-friendly technical support team.

"We are proud to be a part of the growing Korean industry and are confidently looking forward to strengthening our excellent position in the Korean market" reports Office Manager Olaf Lingstädt.

### Becker Marine Systems Korea

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### EXHIBITIONS 2009

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	Europort, Ahoy Rotterdam, Netherlands, Booth No. 1.105, November 3 <sup>rd</sup> -6 <sup>th</sup> , 2009
	Marintec, Shanghai, China, German Pavilion, 2E41-4, December 1 <sup>st</sup> -4 <sup>th</sup> , 2009