

Germanischer Lloyd

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# nonstop

the magazine for customers and business partners

GL TONNAGE

# 100,000,000 – One Class

CONTAINERSHIPS New Dimensions

STRATEGY Interviews with Shipowners

TECHNOLOGY More Efficiency, Lower Emissions





# Germanischer Lloyd



## **THANK YOU** FOR ENTRUSTING YOUR SHIPS TO GL!

The GL-classed fleet has exceeded the 100 million GT mark. Your loyalty has contributed to this shared achievement. We look forward to applying this formula for success with you in the future.

Germanischer Lloyd SE  
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## Dear Readers,



Erik van der Noordaa

**A SPECIAL JUBILEE** distinguishes this issue of *nonstop* for Germanischer Lloyd: our enterprise, which can look back at a proud history spanning 144 years as a classification society, has for the very first time passed the 100-million GT mark for classified tonnage. More than 7,200 ships now operate with "Class GL".

The vessel to break the magical boundary was the 300-metre container carrier "Santa Rosa", built by the South Korean yard Daewoo and owned by the shipping company Hamburg Süd (page 12). It comes as no surprise that this is a containership. First of all, the success story of container shipping as the pace-maker for globalisation continues (page 18). Added to that, GL is the world leader in this segment, with customers like the Chinese shipping company COSCO (page 38) and a market share of over 40 per cent.

**GL ALSO LEADS** in its offering for efficiency enhancement. Optimisation of the hull shape, improvements in engine control, software-supported operations and voyage management – concentrating on all the technical measures is important in order to even come close to achieving the ambitious CO<sub>2</sub> reduction targets as shown in a topical article on GL's research (see "Extra", page 63). And GL experts know where this journey is taking us: for the first time, they outline the concept for an emission-free containership (page 72).

**SAFER, SMARTER, GREENER:** GL's philosophy is also becoming more and more important for other segments of shipping – it applies to standards for lifeboats on cruise liners (page 56), to technical support for yacht building (page 46) and to innovative methods of underwater welding (page 76). In bodies such as the Hellas Committee (page 42), GL enters into an intensive dialogue on economic and technical matters with its customers – and masters the challenges of the future together with them. Closeness to the customer: this goal is pursued, not only at the over 200 locations of GL worldwide but also through the new management structure of the maritime business segment (page 86), making us even more efficient – to your benefit.

We look forward to reaching the next milestone with you!

Yours sincerely,

A handwritten signature in blue ink, consisting of a stylized 'E' followed by a long, sweeping horizontal line that extends to the right.

Erik van der Noordaa  
Chairman of the Executive Board, Germanischer Lloyd SE

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Photo: Hamburg Süd

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Photo: Hasso Hoffmeister



Photo: Neptun Marine Services

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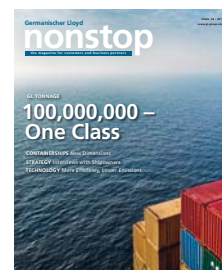
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Cover Photo: Christoph Papsch





## Deep Blue

Checklists at the ready! GL's Dr Stephan Hinz and Andrew Robertson at the start of the sea trials with "Curasub". The submarine has recently been classed by GL.

The "Curasub", designed, built and part-owned by Canadian Phil Nuytten, is a tourist submarine with a unique twist. It is designed to work in the deep waters off Curaçao, where it will take a restricted number of passengers into the darker depths of the ocean. The submarine is rated for 1,000 feet or a little over 300 metres.

The classification process was based on the document and drawing approval, performed by GL's underwater technology experts. After undertaking the technical review, GL project leader Hinz and local surveyor Robertson flew to Curaçao to supervise the successful testing of all the crafts' operational and safety functions.

Nuytten's Vancouver-based company Nuytco Research holds several patents and invented the "Newtsuit". This deep-diving suit allows a diver to work in extreme depths without the use of mixed gases or the need to consider decompression and careful ascents. Essentially, it is a one-man "submarine that you wear". The latest development of this is the "Exosuit", which will also be classed by GL.

Another notable achievement from Nuytco has been the "DeepWorker 2000", a one-man submersible capable of 2,000-foot (600-metre-plus) dives, which has been used in many research and government projects, including NASA.

#### FOR FURTHER INFORMATION:

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Photo: Barry Brown

# news



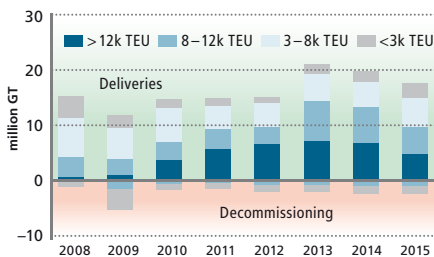
TREND REPORT 2011

## Growth in Container Shipping

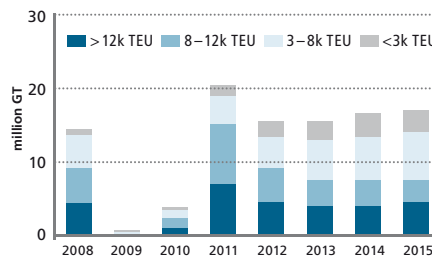
**THE GREATEST RISKS** for the global economy lie in Europe and the USA – and have increased over the past few months. The debt crisis on both sides of the Atlantic and a considerable weakening of the recovery are jeopardising world trade. Under the as-

sumption that the global economy will grow by four to five per cent in 2011, as predicted by the IMF, the transport volumes for container shipping will increase by seven to eight per cent. Especially on the North-South routes and within Asia,

### Containerships: rising tonnage



### Orders: high activity



GL's Trend Report (3rd quarter 2011) expects the growth rate in container traffic to exceed ten per cent.

The strong inner-Asian trade is forecast to cause a rising demand for containerships with a size between 3,000 and 8,000 TEU. In addition, the boom for cargo vessels with a capacity of over 10,000 TEU for the "speedways" between Europe and Asia will

Photo: Dreamstime/Gary Blakeley/Frank Hermers

SHIPOWNER

## Alliance of Long-Standing Business Partners

**NORDDEUTSCHE REEDEREI H. SCHULDT (NRS)** and Germanischer Lloyd (GL) signed a global cooperation agreement today covering all areas of classification as well as flag state supervision of the ships of Norddeutsche Reederei H. Schuldt sailing under GL class.

As one of the world's leading container and tramp shipping management companies with a fleet of 80 ships, NRS benefits from GL's extensive range of services. As a classification company, GL offers the development of standards, rules, and guidelines



for the design, construction and operation of ships, as well as their regular inspections and audits. GL supports Norddeutsche Reederei with various services in order to ensure compliance with international regulations and facilitate the use of modern

technology for GL-class ships. "The cooperation represents a milestone in our long-standing cooperation. It highlights our trust in GL's expertise and serves as the basis for further joint activities in the future," says Markus Hempel, Director of Norddeutsche





**OUTLOOK.** The transport volume in container shipping is set to rise by about ten per cent in 2011.

lead to a tangible rise in tonnage during the period from 2013 to 2015 – as much as 20 million GT may be added. On average, says the GL Trend Report, the worldwide container fleet is poised to grow by eight per cent annually up until 2015.

However, the prerequisites for this are that the weakness of the US economy is temporary and that the growth in Asia re-

mains stable on a high level. Continuous delivery of megaboxers and the seasonal dip in demand will put further pressure on the charter rates in the coming months and increase the number of laid-up vessels. Rising prices for ship fuel will also constrain the earnings of the shipping companies. At 600 US dollars per tonne, bunker costs reached 2008 levels in the second quarter.

**PARTNER.** (f.l.t.r.) Tobias Meincke (GL), Jens Ahrenkiel (GL), Torsten Schramm (GL), Heinz-Jürgen Danckers (NRS), Markus Hempel (NRS) and Erik van der Noordaa (GL) confirmed the agreement between NRS and GL.

Reederei H. Schuldt. "GL can look back on a positive long-standing business relationship with Norddeutsche Reederei H. Schuldt. With a view to the future and the size of their fleet, we have decided to intensify our cooperation in order to be even better prepared for future projects," says GL's CEO Erik van der Noordaa about the cooperation agreement.

#### TEXTBOOK

## Practical Ship Hydrodynamics

**THE SECOND EDITION** of "Practical Ship Hydrodynamics – A Practical Guide to Hydrodynamic Considerations and Modeling for Successful Ship Design, Construction and Development" will be available in October 2011. The book brings together information from different fields of marine engineering into one resource to provide an overview of hydrodynamic experimental and numerical methods for ship resistance and propulsion, maneuvering and seakeeping as well as vibration. The author, Volker Bertram, is a Senior Project Manager at Germanischer Lloyd and Professor of Ship Design at the Technical University of Hamburg, Germany.



**CERTIFICATE.** ERS team members Kai Ahlers and Hanns-Otto Schott.

#### ERS

## Operation at the Loreley Rock

**AWARD** for the Emergency Response Service (ERS) of GL: The ERS team played a major role in the salvage of the chemical tanker "Waldhof" at the beginning of the year near the Loreley Rock. Kurt Beck, Minister-President of Rhineland-Palatinate expressed his gratitude for the successful mission with a commemorative medal and a certificate. By performing extensive calculations, the GL experts were able to determine the most suitable lighting and salvage scenario for the stricken vessel.

# news

**PROPULSION**

## Solar Ship with GL Class

**THE WORLD'S LARGEST** sun-powered ship, the "Tûranor PlanetSolar", berthed in Hong Kong's Victoria Harbour in mid-August. "We were able to see the boat from our office – an amazing sight," said Marin Chen. The GL manager was able to get a few good snapshots of the arrival of the GL-classed "PlanetSolar". Built by Knierim Yachtbau in Kiel, this unusual vessel is 35.25 metres long and 15.80 metres wide. The "Planet Solar" is the first entirely solar-powered ship to have sailed around the globe.

**HONG KONG.** The "PlanetSolar" entering Victoria Harbour.



**FUN.** 4,000 young people will enjoy their first sailing experiences this year.

**NEW GL CLASS**

## Ship Design for Tomorrow's Seafarers

**"TEAM ACHT"** is the first sail training boat that was especially developed for young sailors – classified by GL. The sports centre at the University of Kiel (CAU), the Institute of Shipbuilding at Kiel University of Applied Sciences and entrepreneur Dirk Lindenau all teamed up to design the new training boat "team acht". The "Schüler Segeln in Schleswig-Holstein" ("Pupils Sail in Schleswig-Holstein") association was founded as part of the "Zukunft Meer" ("The Sea - Our Future") state initiative. Thanks to contributions by sponsors, seven sailing boats of this series have already been built, and an eighth is under construction.

"team acht" was designed on the computer. Following a number of 3D models and a variety of simulations, the final design was realised as a sandwich construction. To make the construction work as cost-effectively as possible, some of the sailing boats are being built in the regional centre for vocational training on the Kiel Canal un-

der the direction of the pupils themselves. The technical design of "team acht" aims to meet the requirements and wishes of the young sailors and is characterised by a high level of quality, safety and performance. The boat is specially intended to serve the needs of beginners and offers eight metres of ship for eight trainees. The special feature is that the instructor is on the same boat. "team acht" thus has the advantage that commands and explanations can be understood easily and implemented accurately. For more information: [www.schuelersegeln-sh.de](http://www.schuelersegeln-sh.de)



**TEST.** The "team acht" is designed to serve the needs of beginners.



#### NEWBUILDING.

The GL SeaScout software will support the crew of the "MSC Savona" with route planning.



Photo: Hasenpausch

#### VOYAGE MANAGEMENT

## Access to Weather Forecasts and Navigational Data



**SAFETY.** GL SeaScout evaluates wave and weather data.

**OPTIMAL SHIP ROUTING** is understood to result in lower voyage costs while maintaining safe passage. However, seaway and weather conditions can pose variables that require modification of the initially planned route. In spring, GL Maritime Software's navigational decision-making support system GL SeaScout 2.0 was installed on board Reederei Claus-Peter Offen's 14,000 TEU newbuilding "MSC Savona".

GL SeaScout is an integrated onboard system that provides ship's officers with decision-making support. By combining advanced computations with seaway measurements, wave and weather forecasts, cargo data and other signals, GL SeaScout informs a ship's officers of how the ship is responding to current conditions. It allows the officers to simulate different speeds and courses

and to optimise the parameters to the prevailing seaway and loading conditions of the ship.

"GL SeaScout as a system works very well, giving good assistance with checking the vessel's movement in heavy seas. The software is simple and user-friendly," says master Piotr M. Kruszewski, commanding the "MSC Savona". This GL SeaScout installation contributes to a joint development project of GL and Korean shipyard DSME (JDP Springing & Whipping) in order to record environmental conditions on a long-term basis.

The objective of this measurement project is to collect data for GL's ongoing rule development. In addition, the information will be used by FutureShip, a GL company, for validation of numerical simulation methods with respect to whipping and springing phenomena.

#### E-LEARNING

## GL Launches Tool for Maritime Labour Convention, 2006

**AS THE DATE** when the Maritime Labour Convention, 2006 (MLC 2006) comes into force rapidly approaches, shipowners, managers, crewing agencies and seafarers are starting to familiarise themselves with the new requirements. With some 55,000 seagoing vessels requiring certification of compliance and the regulations impacting on every level of an organisation, this preparation is a massive task.

To support the maritime industry in this, GL has developed a comprehensive e-learning tool for the MLC, 2006 in CD form, the first such tool covering the convention. It touches on all relevant aspects and explains every single regulation

of the convention step by step. Olaf Quas, GL's Global Head of Practice ISM/ISPS/MLC 2006, explains: "This e-learning tool has been created with both the crew on board and shore-based personnel in mind, but its portability and ease of use will be especially helpful for personnel who cannot easily visit a training seminar."







**LOGISTICS.** Loading at the Burchardkai terminal in Hamburg. In 2010, Hamburg Süd carried more than 2.8 million TEU over the oceans.





# Efficiency and Environmental Protection – the Pressure is on

With classification of Hamburg Süd's container carrier "Santa Rosa", the tonnage of Germanischer Lloyd has passed the 100-million-GT mark. In discussion with *nonstop*, Dr Ottmar Gast, Chairman of the Executive Board of the Hamburg-based shipping company, expresses the expectations he has of classification societies and emphasises the growing significance of environmental protection, safety and energy efficiency for the shipping industry



**FLEET.** The “Rio Bravo”, seen here reaching the harbour of Antwerps. Hamburg Süd controls a fleet of far more than 100 containerships.

► **NONSTOP:** The shipping sector has just weathered a serious crisis, and now the international finance markets are in turmoil again. How does a shipping company react to unstable markets and exchange rates?

**DR OTTMAR GAST:** Anyone engaged in shipping is accustomed to volatile developments. Nevertheless, the 2008/2009 crisis was particularly tough. If the current uncertainties lead to a repeated drop in cargo volumes, the only solution will be to cut costs by laying up capacities – capacities that will then no longer be needed. Apart from that, the past crisis showed that not only flexibility in the deployment of tonnage but also decent equity levels for ships and containers in conjunction with a solid financial policy are extremely important.

**NONSTOP:** Ship efficiency and environmental protection are playing an ever-greater role in shipping. How do you view the introduction of the Energy Efficiency Design Index?

**DR GAST:** The decision of the IMO to introduce the Energy Efficiency Design Index is a logical step that deserves to be welcomed. The implementation of this globally valid standard will strengthen the position of the oceangoing vessel as an energy-efficient means of transport, and will help to further reduce the environmental burden of sea shipping in future.

An enterprise like Hamburg Süd, which has codified the reduction of the ecological impact in its safety, environment and quality policy and is pursuing this goal with great commitment through a variety of environmental protection steps at sea and also ashore, is surely confirmed in its endeavours by the introduction of the EEDI. The EEDI Quickcheck

of Germanischer Lloyd shows that the existing fleet of Hamburg Süd observes the limits set by the EEDI and even undercuts them substantially. This will apply all the more so to the newbuildings currently on order. The EEDI will provide a better comparative baseline for the chartering-in of energy-efficient ships.

**NONSTOP:** How will the EEDI affect the competitiveness of shipping companies?

**DR GAST:** I believe that shipping companies which have neglected to implement environmental protection measures will come under increasing pressure. In contrast, companies like Hamburg Süd, who have always placed great emphasis on operational efficiency when specifying their newbuildings, will maintain their competitive edge and even extend it.

As a fundamental point, it should be noted that the EEDI does not evaluate the ship operation actually being practised. This is expressed through the Energy Efficiency Operational Indicator (EEOI), which is already considered in benchmarks of the Clean Cargo Working Group (CCWG). Hamburg Süd is an active member of the CCWG, a collaboration of shippers and shipping companies that are working towards increased sustainability in the transportation industry.

**NONSTOP:** Recently, Germanischer Lloyd passed the tonnage mark of 100 million GT. The ship with which this memorable milestone was reached is the “Santa Rosa”, belonging to Hamburg Süd. What is your assessment of the longstanding teamwork between Hamburg Süd and Germanischer Lloyd?

**CCWG.** A B2B initiative of shipping companies and forwarders. Every year, its members submit a report on their environmental performance according to a standardised procedure.



*Nowadays, a modern classification society cannot see itself as being just a supervisory body.*



**DR OTTMAR GAST**  
Chairman of the Executive Board, Hamburg Süd

**DR GAST:** Over the years, the cooperation with Germanischer Lloyd was always good and it remains so today. Nevertheless, we think that Germanischer Lloyd must take care to ensure that its core competency – the provision of superior know-how and valuable experience in the field of maritime technology to the shipowners – is not neglected in favour of concentrating on other business areas.

**NONSTOP:** And where, quite generally, do you see the primary functions of the classification societies?

**DR GAST:** As I've already mentioned, we view the core tasks of a classification society as lying in assisting the shipowners with their newbuilding projects and providing support for the classified fleet. To fulfil these duties, a classification society needs outstanding engineers in the various fields of shipbuilding, maritime mechanical engineering and marine electrical engineering.

**NONSTOP:** What expectations do you personally have of a modern classification society?

**DR GAST:** More than ever before, a modern classification society cannot see itself as being just a supervisory body acting as the long arm of the corresponding flag state in the broadest possible sense. Technical problems will always arise in the operation of a ship, and so the class should, first and foremost, view itself as a partner for the shipowner in solving these problems.

Because energy has become more expensive, reducing fuel consumption in sea transport has achieved a very high priority. Here the classification society could position itself as a "sparring partner" for the shipping companies. Many classification societies already have a high level of competence in the newbuilding sector; at Germanischer Lloyd, this is particularly evident in the hydrodynamic optimisation of hull shapes.

It would be good if the classification societies could additionally build up knowledge and experience relating to the day-to-day management of the ship – above all, for engine operations. Of course, we would be glad to offer assistance in this regard, because our shore personnel and seafaring staff have the necessary experience and naturally also the necessary motivation. ■ **OM**

**PROFILE**

## Hamburg Süd

Over a period of 140 years, the shipping company Hamburg Süd – a member of the Oetker Group – has grown to become a global provider of transport logistics.

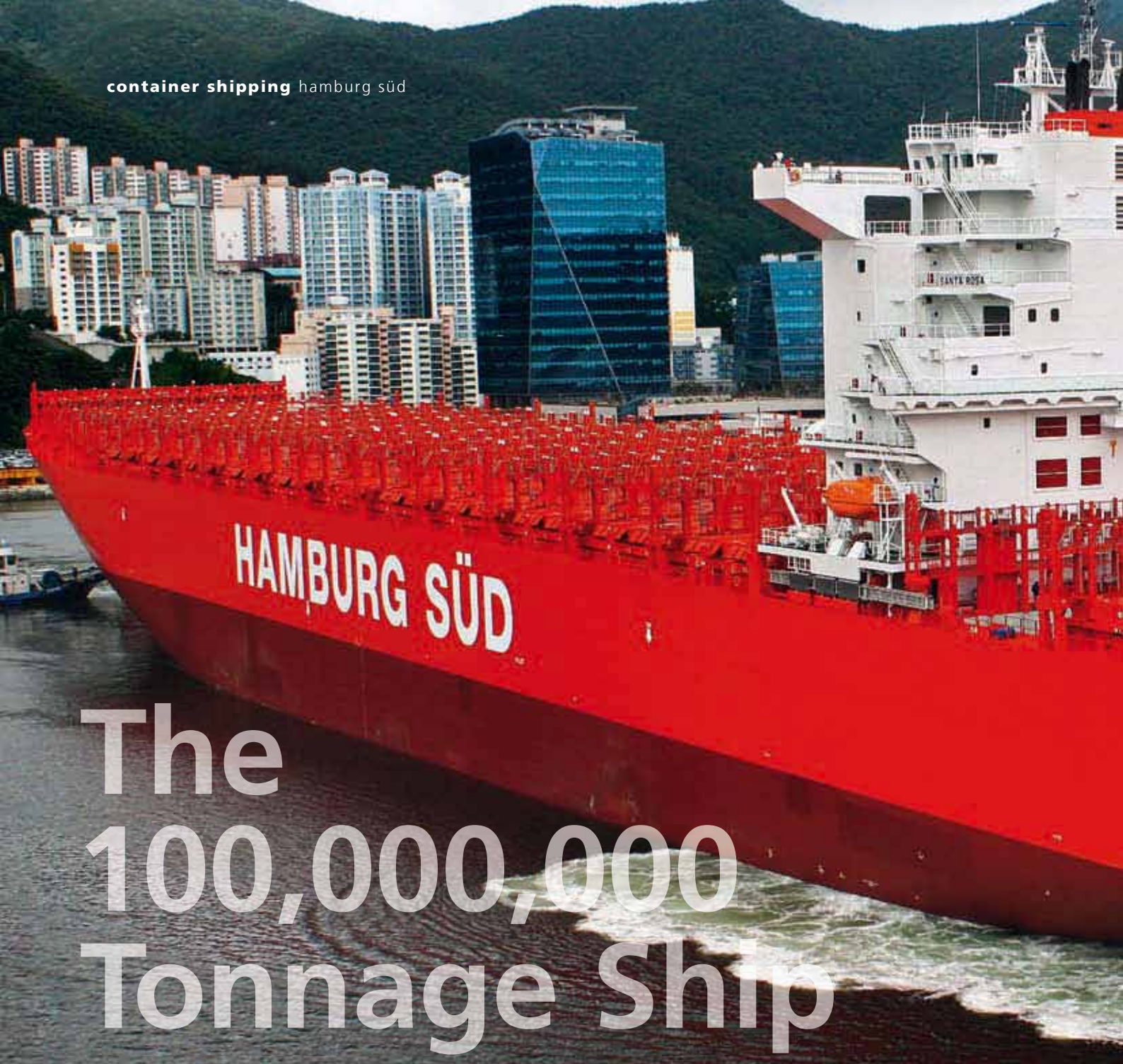
- Germany's largest privately-owned shipping company belongs to the 20 largest container carriers worldwide and is one of the leaders in the north-south trades.
- Rising transport volumes and higher freight rates gave Hamburg Süd another record year in 2010.
- The shipping company controls a fleet of some 170 vessels. The share of owned ships (about 40) is steadily being expanded.
- Quality, reliability and environmental commitment: in recent years, Hamburg Süd has received numerous awards for its superior performance and achievements.

## Successful Results

	2009	2010
Containerships	96	113
Slot capacity	304,000 TEU	371,000 TEU
Container pool	338,000 units	396,000 Units
Employees	4,046	4,099
Carryings	2,330,000 TEU	2,871,000 TEU
Turnover	EUR 3,193 m	EUR 4,430 m
Capital expenditure	EUR 167 m	EUR 429 m

Source: Hamburg Süd





# The 100,000,000 Tonnage Ship

Germanischer Lloyd's active fleet  
is growing – proof positive of the  
trust of its customers and the quality  
of its services

A noteworthy milestone for Germanischer Lloyd: the ships in service classed by the classification society have broken through the magical tonnage barrier of 100 million GT. With the new vessel, the "Santa Rosa" of shipping company Hamburg Süd, some 7,200 ships are now regularly surveyed by GL.

The "Santa Rosa" is the sixth newbuild in a series of ten identical containerships. The GL jubilee ship is able to carry





SHIP DATA

## "Santa Rosa" by Numbers

<b>Shipowner:</b> Hamburg Süd	<b>Length between perpendiculars:</b> 286.8 m
<b>Tonnage:</b> 93,430 dwt	<b>Beam:</b> 42.8 m
<b>Total capacity:</b> 7,100 TEU	<b>Draught:</b> 13.5 m
<b>Reefers:</b> 1,600 TEU	<b>Speed:</b> 22.2 kn
<b>Length overall:</b> 299.9 m	<b>Output:</b> 41,180 kW
	<b>Class:</b> Germanischer Lloyd

7,100 standard boxes and surpasses the requirements of the environmental Energy Efficiency Design Index (EEDI) standard, which is to come into force worldwide.

The vessel is one of the largest taken into service by Hamburg Süd to date. The shipping company is also aiming at continued growth in the size of its ships, having ordered six 9,600 TEU units. Starting in 2013, these container giants will be integrated into the growing fleet – with GL class. ■

Photo: Hamburg Süd



# Size Matters

Ship size is something John Meredith is worried about. While size is a working parameter of his business, the development over the past few years has simply been too fast. “It is not yet clear by how much the container carriers can grow before we run into serious problems,” the head of the port operating company Hutchison recently told the trade journal *Lloyd’s List*. Meredith should know. With headquarters in Hong Kong, Hutchison Port Holdings is the largest operator of container terminals worldwide, with facilities in 51 ports. Its European bases include Rotterdam and Felixstowe.

John Meredith fears that the ports will no longer be able to keep up with the rapid growth of the ships. In 2006, the Danish liner company Maersk launched the “Emma Maersk” as the first mega-carrier to accommodate more than 10,000 standard container units (TEU). Since then, the shipping sector has been on a supersizing spree. A new type of containership – designed with the aid of Germanischer Lloyd, amongst others – was built at the leading South Korean yards of Hyundai, Samsung and Daewoo. With these ships, the wheelhouse is located apart from the engine room, relatively far forward. Through this arrangement, considerably

Photo: Courtesy of the Port of Felixstowe





More than 15,000 container units can be stowed on board the world's largest container carriers. Even larger ships are in the planning stages – and the growth trend continues

more containers can be stacked on deck without obstructing the visibility of the crew in the forward direction. Usually, these ships are 366 metres long and between 48 and 52 metres wide. More than 90 ships with capacities exceeding 12,000 TEU were already in service in mid-2011, most belonging to this new type.

#### **Race for Capacity**

Until now, the major shipping lines MSC and CMA CGM, the two biggest competitors of Maersk, have been the leaders in the new generation of container carrier. Back in 2009,

MSC and the Hamburg shipowner Claus-Peter Offen commissioned the "MSC Daniela" and in 2010 the "MSC Savona". With a cargo capacity of about 14,000 TEU each, these container giants marked a new size record. Maersk responded promptly to this advance. At the beginning of 2010, the Danish company announced that the "Emma Maersk" and her seven sister ships would not stow 10,000 TEU, as reported initially, but in fact 15,000 TEU.

And that was not the only news. Although the world-wide economic crisis, which had dealt the shipping industry a severe blow, was not yet over, the designers at Maersk ▶

#### **LOGISTICS.**

Clearance of giant container vessels at the Trinity Terminal in the harbour of Felixstowe, UK.



Photo: Danis Cornelissen

**ROTTERDAM.**  
The bigger the vessels, the greater the challenges for port logistics. Crowded quays often don't leave enough space for hauling cargo and supplies on and off.

► had already planned their next step. In February 2011, the shipping company revealed its next coup: the next generation of containerships would be able to carry no less than 18,000 TEU. The first unit of 20 currently on order is scheduled to come under way in 2013.

Such ships are likely to trigger more than 10,000 container movements per call in certain key ports. Port experts like Hutchison's helmsman John Meredith view these developments with scepticism. For such enormous vessels, a terminal needs not only the corresponding container cranes and quay

facilities but also marshalling areas and sufficient handling equipment to be able to move the boxes quickly. But adequate space behind the quay walls is often in short supply at many harbours.

### Slow Steaming

Naval architects and designers, on the other hand, see no problems ahead in moving 18,000 TEU. "There will surely also be a run on the new carriers offering 18,000 TEU. After all, size does give you cost savings," says Jan-Olaf Probst, Executive Vice President Ship Newbuilding at Germanischer Lloyd. "A number of shipping companies will definitely join the 18,000 TEU class." In less than five years, the capacity horizon for containerships has almost doubled.

The logic of costs in liner shipping is compelling. As long as larger ships can be deployed efficiently, especially on long-distance routes with high cargo volumes, they will be built. This is because transport cost per container drops with the size of the ship – given a high utilisation level for the vessel.

Experts such as GL's Jan-Olaf Probst are already thinking beyond the 18,000 TEU barrier. "Together with STX of South Korea, Germanischer Lloyd has produced a study for a 22,000 TEU ship. This size could be built without any problems," the GL engineer says confidently. "The size is also

**ADVANTAGE.**  
*Modern super-post-Panamax ships with about 13,000 TEU consume 30 per cent less fuel per container than a common 8,500 TEU vessel.*

### SUPER-POST-PANAMAX.

The "E.R. Benedetta" is a 13,100 TEU vessel of the latest generation. The ship will be delivered in November and will receive the "Environmental Passport" of Germanischer Lloyd.

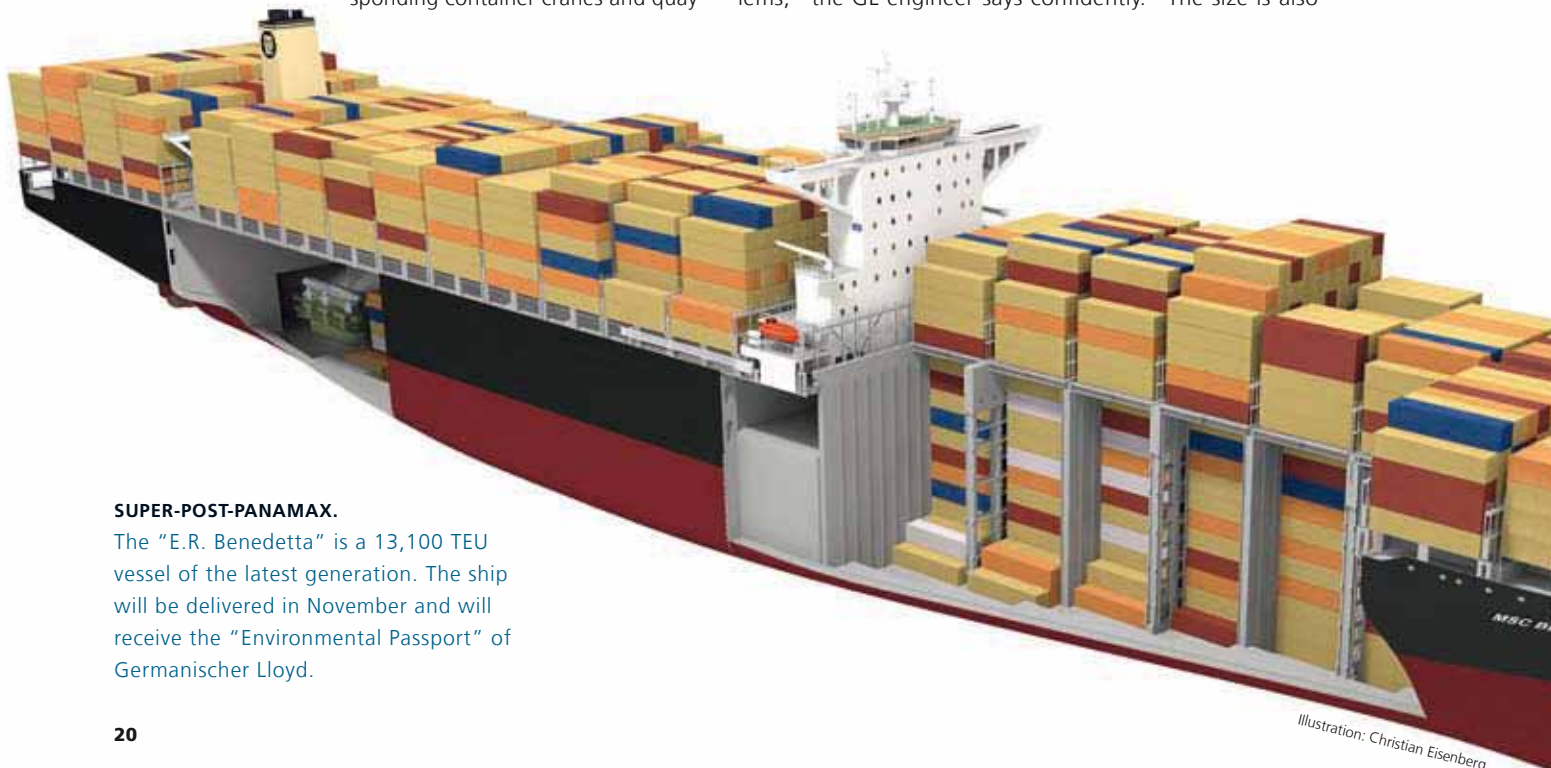


Illustration: Christian Eisenberg





Photo: Hasenpflusch

**FLAGSHIP.** The “Savona” and eight sister vessels have been chartered by MSC from shipowner Claus-Peter Offen. The giants’ capacity is about 14,000 TEU each.

growing to provide economic compensation for the drop in service speed from 25 or 26 to 22 knots.”

With that, Probst is touching on another major trend in container shipping. For a long time, high service speeds played a decisive role in container shipping. Now efficiency and reduced fuel consumption is increasingly in the focus of attention. Calculations of operating economy performed by GL yield unequivocal proof of the cost benefits offered by a decrease in service speed. Since 2006 – long before the global economic and financial crisis – the Hamburg-based classification society has advocated “slow steaming”.

In the meantime, this approach has gained widespread acceptance by the market. The collapse of global trade in 2008 led to a rethinking process in the industry. Without slow steaming, the shipowners would have had to lay up more ships during the crisis; moreover, in the phase of economic recovery since March 2009, the concept has helped deal with over-capacities.

### Efficient Engines

This trend has been confirmed for new-buildings. Hull design and engines are being adapted

accordingly. “With the new 9,000 TEU ships, a service speed of 21 knots is becoming standard. In comparison to 25 knots, which was usual speed for a long period, particularly in the Far East trade, this makes a huge difference,” says Matthias Becker, General Manager Ship Design at the Hamburg headquarters for Germany of the Finnish engine manufacturer Wärtsilä. Wärtsilä as well as its greatest competitor in ship engines, MAN Diesel, are working on optimising the engines and their fuel consumption – bearing in mind that the requirements for climate protection and for the pollutant content of the exhaust gases will become stricter.

While shipping companies are exercising new-found modesty in propulsion, it will be interesting to see just how far the growth in vessel size will go, particularly for containerships. Even Hutchison’s Meredith does not believe that the limit to growth will be reached at 18,000 TEU. However, he would welcome more intensive discussions with the shipping companies on the way forward for ship sizes. “We are already wondering when somebody will announce a 24,000 TEU leviathan,” he says, “and also what we as port operators can do about it.” ■ OP

#### FOR FURTHER INFORMATION:

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# The Whole World in a Box

Without containers, there would be no globalisation.

German companies and engineers played a major role in the success of the standardised shipping container





**M**ajor developments came about in the period following World War II, lending fresh impetus to world trade. The European Community was formed and prospered as a zone for free trade. Between the continents, strong new trade routes were opened up – especially between Europe and the United States, and also between the USA and Asian countries such as Japan.

The free movement of capital, coupled with the rapid development of communication technologies, pushed the global economy forward from the 1950s on, despite the Cold War between East and West. The world-spanning interchange of commodities increased and, with it, the influence of the multinational corporations, which operated production facilities in many countries simultaneously. Modern globalisation of industry had begun.

Nevertheless, a decisive medium for this process was rarely noticed by the general public: a steel box, more than 6 metres long, 2.44 metres wide and 2.60 metres high. The 20-foot standard container – twenty-foot equivalent unit or TEU – came into use during the 1960s as a benchmark for the burgeoning sector of global logistics. Without the shipping container, as a kind of silent partner to world trade, globalisation in its current form would be unthinkable.

### **The Logic of Logistics**

American forwarder Malcom McLean began using identical boxes for transporting goods by ship in 1956. He laid the foundation for the boom of the shipping container, the dimensions of which were standardised internationally in the early 1960s. The container revolutionised the world of ▶



**SYMBOL.**  
Container trade  
now embraces  
the entire globe.



Photo: Maersk-Sealand  
Photo: Eurokai



Photo: Eurokai

**PIONEER.** Malcom McLean was the first to use a big box.

**STANDARD.** Kurt Eckelmann fought for uniform sizes.



Illustration: Karsten Kumbert

**CONVERSION.** The maiden voyage of the "Ideal X" as a containership took place in 1956 on the Newark–Houston route.

► general cargo shipping, the logistics sector as a whole, and thus ultimately world trade. Thanks to the standardised handling procedures, transporting a package in a container has become so economical today that distance no longer matters. Only in this way was the global economy able to move closer together as a "global village".

### Standardisation and Rationalisation

Since the 1960s, German companies have played an important role in the development of container traffic. As the German negotiator at the International Standardization Organization (ISO), the Hamburg port entrepreneur Kurt Eckelmann played a decisive part in having internationally applicable dimensions for containers laid down in 1964. Since then, shipping companies and logistics companies ashore have been able to coordinate their handling equipment. To unload 20 tonnes from a general cargo ship, a gang of six dockworkers are kept busy for at least half a day. One man operating a container gantry crane is able to shift a box in less than one minute from the ship to the quay or in the opposite direction.

German shipyards became masters in designing and building containerships. The first dedicated containership in the world was the coastal freighter "Bell Vanguard", deliv-

ered by the Sietas yard of Hamburg-Neuenfelde in 1966. This vessel was the very first to be constructed according to the new standard dimensions for containers. Up until the 1980s, German yards such as AG Weser and Vulkan in Bremen, Blohm + Voss in Hamburg and Nordseewerke in Emden delivered the world's most up-to-date – and frequently also the largest – containerships of the time. However, large shipbuilding groups from Japan, South Korea and later also China pushed the German yards out. Since the last worldwide economic crisis, the industry in Germany does not expect that any further major orders for containerships will be placed with German shipyards.

Nevertheless, German shipping companies are still the leaders in container transport. Hapag-Lloyd was established in 1970 as the merger of Norddeutsche Lloyd of Bremen with Hapag of Hamburg. This fusion was primarily driven by the pressure of modernisation and rationalisation that was triggered by the success of the container. In the 1970s, the era of the general cargo ship started coming to an end. Many shipping companies did not have the financial clout to weather this sweeping structural change. Others, like Hapag and Lloyd, joined forces through mergers. Until now, Hapag-Lloyd – currently ranked fifth largest of the world's container

**FORMAT.** The "big" 40-foot standard container as per ISO is approximately 2.44 m wide, 2.59 m high and 12.19 m long on the outside. Its volume is 67 m<sup>3</sup>, with a tare weight of 3.78 tonnes.

**MILESTONE.** The "Frankfurt Express" of 1981 represented the then new Panamax class with 3,430 TEU.

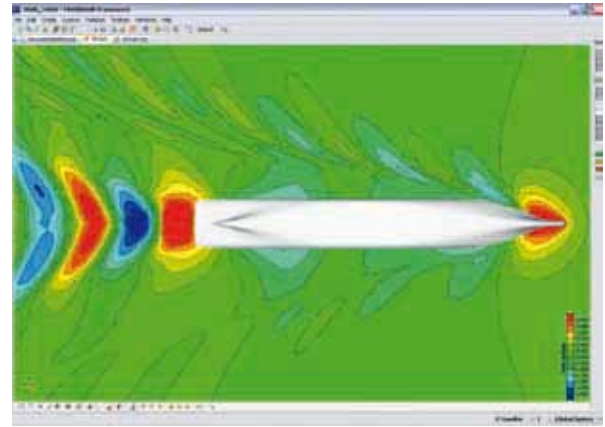


Illustration: Karsten Kumbert





**COASTAL CARRIER.** The first German containership was the “Bell Vanguard” with 67 TEU, built by Hamburg’s Sietas yard in 1966.



**SIMULATION.** Experts of the GL subsidiary FutureShip are working on improving the hull shape.

**DEVELOPMENT**

## Dynamic Growth in Size

Ever longer, ever wider, ever higher: the capacity of container carriers has increased twentyfold over the past 50 years. Shipyards are currently busy with the construction of 18,000 TEU ships (see p. 18).

**1ST GENERATION: 1956 – 1970:**

Converted freighters and tankers; length: 135 to 200 m; draught: 9 m; 500 to 800 TEU



**2ND GENERATION: 1970 – 1980:**

Cellular containerships; length: 215 m; draught: 10 m; 1,000 to 2,500 TEU



**3RD GENERATION: 1980 – 1988:**

Panamax class; length: 250 to 290 m; draught: 11 to 12 m; 3,000 to 4,000 TEU



**4TH GENERATION: 1988 – 2000:**

Post-Panamax; length: 275 to 305 m; draught: 11 to 13 m; 4,000 to 5,000 TEU



**5TH GENERATION: 2000 – 2005:**

Post-Panamax Plus; length: 335 m; draught: 13 to 14 m; 5,000 to 8,000 TEU



**6TH GENERATION: FROM 2006**

New Panamax; length: 397 m; draught: 15.5 m; 11,000 to 14,500 TEU



liner companies – has continued to be successful in the face of stiff competition. The shipping company Hamburg Süd, which belongs to the Oetker Group of Bielefeld, is one of the leading shipping companies for liner services between the northern and southern hemispheres.

### Financing and Optimisation

Container shipping in Germany was accorded particular importance by the owning ship companies during the past few decades. Enterprises such as CPO, Peter Döhle, E.R. Schiffahrt and Hansa Treuhand operate fleets comprising dozens of vessels, with some exceeding a hundred. They charter out the ships to liner companies such as Maersk, MSC, CMA CGM, and also Hapag-Lloyd and Hamburg Süd. In total, German shipowners control and operate more than 1,700 of the over 4,800 container carriers currently under way worldwide. This concentration was possible chiefly because here the know-how for shipbuilding and shipping meets the specialisation of financial institutes. Over many years, issuing houses collected billions of euros from private investors, offering good yields on the whole. Banks such as HSH Nordbank and Norddeutsche Landesbank provided the remaining capital – as a rule two thirds of the ship’s price tag – in the form of a loan. Whether the German “KG model” will return to its previous glory after all the setbacks of the global economic crisis is still an open question (see p. 60).

What remains is the highly specialised business of development and engineering. Hamburg is an important centre worldwide for the design and optimisation of new ships. Specialists like GL, the Hamburg Ship Model Basin and, as of recently, a newly founded Fraunhofer Institute at the Hamburg University of Technology are carrying forth the long tradition of German shipbuilding – while the local shipyards continue to pale in significance. ■ OP

# Diversification Avoids Pitfalls

The Greek shipowner Michael Bodouroglou, founder and CEO of Paragon Shipping, and Chairman, President and CEO of Box Ships spoke with *nonstop* about the fundamentals of the shipping business and his strategies for success in uncertain times

**NONSTOP:** Mr Bodouroglou, do you think Fukushima will affect global trade and Japan's role in shipping?

**MICHAEL BODOUROGLOU:** I am not sure whether Japan's role in global trade will be reduced as a result of the Fukushima incident. However, we have to think again about the merits of nuclear energy. Growing resistance to the use of nuclear energy is having a clear impact on the demand for fossil fuels, which is growing rapidly. Coal seems to be emerging as the winner of this unfortunate situation, alongside LNG and other fossil fuels such as oil. This is good news for the dry bulk market.

**NONSTOP:** What developments do you see in global trade?

**BODOUROGLOU:** There are extremely positive developments stemming from the new emerging economies in Asia, such as Vietnam and Indonesia, to name only two, as well as in Africa, while in Europe and the U.S. the demand for energy is stagnating. In terms of world trade we see the demand for shipping going up. The demand for containerships, which is closely related to world trade, has increased an average of 8.5 per cent annually for the past thirty years, and we expect continued growth in this segment.

As far as drybulk is concerned, the demand side of the equation is okay. The problem lies with the supply side. With a dry bulk orderbook at 43 per cent of the current fleet, the supply side in this segment poses a great problem and inflicts constant volatility upon the market. In the past two years, demand has increased by 7 to 9 per cent per annum, the



**PROUD.**  
Michael Bodouroglou,  
CEO of Paragon  
Shipping, at the New  
York Stock Exchange.





supply side increased by more than 14 per cent, and is expected to continue at this rate at least through 2012. Freight rates are going to suffer; ships will earn less than expected. There are difficult times ahead – at least for the next two years. In the other sectors there is more reason for optimism, as long as the over-ordering mistake of the dry bulk sector isn't repeated there as well.

**NONSTOP:** How are you planning to tackle these difficulties?

**BODOUROGLOU:** We, at Allseas, have developed our own strategy to avoid any pitfalls and financial challenges. In the past, we had diversified into tankers, bulkers and recently into containerships.

We conduct our business in a very fragmented market. There are not four or five players but thousands of shipowners, a number that is difficult to orchestrate. Some of these owners are making bets against the market trend, some even bet against each other. Some are cash rich and are tempted to order irrespective of the size of the orderbooks. Failure to pay attention to the fundamentals of the industry is risky, however.

At Allseas, we manage Paragon Shipping Inc. in drybulk, and Boxship Inc., in containerships. These two shipping sectors have different business cycles and are currently at different stages of their respective cycles. While the bulk market has not even reached the bottom of the cycle, there are good years ahead for container shipping. The biggest threat faced by the shipping company is overleveraging. At Paragon, we are unlikely to find ourselves being overlev- ▶

#### PROFILE

## Michael Bodouoglou

The founder and Chief Executive Officer of Paragon Shipping, has been involved in the shipping industry in various capacities for more than 25 years. He has served as Paragon Shipping's chairman and chief executive officer since the Company was founded in June 2006. He is also the founder and chief executive officer of Box-Ships and he has served as Box-Ships chairman and chief executive officer since the Company was founded in May 2010.

Mr. Bodouoglou has owned and operated tanker and dry bulk vessels since 1993. He is also the founder of Allseas Marine S.A. which serves as the technical and commercial managing company to the Box Ships and Paragon fleets. Mr. Bodouoglou is a member of the Cayman Islands Ship-Owners' Advisory Council and is also a member of the Board of Academic Entrepreneurship of the Free University of Varna, Bulgaria. Mr. Bodouoglou serves as a member of the Hellas Committee of the GL. Mr. Bodouoglou is the Honorary Consul for the Slovak Republic in Piraeus.

▶ eraged as our net position in terms of debt is quite moderate. This is critical for companies to weather the downturn – and only those who are not overleveraged will be able to compensate for a drop in cargo rates and remain liquid. When cash flow eases, overleveraged firms who have no equity left can find themselves under water and without cash.

Paragon is modestly leveraged, and I am optimistic about our future moves and investments. We saw the trend coming a while ago, and have prepared for it. Now, we are taking a wait and see approach and will continually assess our position. Our strategy has always been to focus on medium to long-term charters, and our vessels are on average deployed for the next 16 months.

We avoided to invest in capesize bulkers in the first place, due to the volatility of that market. During a crisis it is time to look for opportunities. Boxship Inc. has had several positive developments this year. The company has been listed at the New York Stock Exchange since 14 April 2011, and we are very optimistic about its growth potential and are looking to explore further acquisition opportunities.

**NONSTOP:** What is your business model for Boxship Inc.?

**BODOUROGLOU:** Our business model is to invest in quality second-hand vessels that are ready to go and that will enable us to pay a good dividend to our shareholders. We buy good vessels with good charters and are always on the lookout for opportunities that can improve our free cash flow, for example, we were able to purchase three vessels from German owners, two were shipyards and one was a private owner.

**NONSTOP:** Are there many boxships on the market?

**BODOUROGLOU:** Not a lot at the moment, but more and more vessels are coming onto the market. Banks are gradually forcing owners to sell now that values have rebounded to prevent further losses and straighten out their balance sheets.

**COMPETENCE.**

Athanasios Reisopoulos, GL's Vice President Area Southern Europe, and Michael Bodouroglou.



“There is no ‘one size fits all’ kind of service.”

**MICHAEL BODOUROGLOU,**  
CEO, Paragon Shipping.

**NONSTOP:** What is the role of banks in your segment?

**BODOUROGLOU:** Banks in Shipping have their own history and business culture. Some are patient, some are impatient. Some can weather the storm while others fail and abandon their clients with a loss. Today the world is more complicated, and banks are dealing with the crisis in a much more differentiated way. They treat clients who have equity remaining in their assets quite differently from those with no equity. There is no “one size fits all” kind of service.

**NONSTOP:** What role do you see classification services playing in the industry as they move into new service areas?

**BODOUROGLOU:** Generally speaking, classification societies of good quality are always welcome. The question is whether they are better suited to provide certain services than other providers? I personally believe they are because they have in-depth experience, they know the vessels, they conduct their own research, and they have a good understanding of the operational necessities. There might be a conflict of interest with respect to the EEDI. When a classification society and a shipyard calculate the Index, who should measure and certify the vessel's performance during the sea trial? Perhaps another service provider? I do not know.

I do think, however, that the industry requires less policing from classification societies. This role is becoming obsolete since the system is policing itself. The situation has changed over the years. Port State Control, vetting and the ISM Code are all measures that have contributed to improved safety and quality management. The ISM Code has been very important in enabling a lot of companies to follow strict quality management regulations.

Classification societies should focus on efforts to overcome the technical challenges associated with reducing emissions. Technical solutions are needed, and classification has a catalytic role to play. It is up to the classification society and the shipyard to sort things out and develop the most efficient vessel designs. As a shipowner, I can only make choices. And all this is also a question of price. All shipowners have a very strong interest in cutting their operating costs by five per cent or more to be able to compete with their next-door neighbour.

**NONSTOP:** What effect do you see new environmental regulations having on the industry?

**BODOUROGLOU:** There is no doubt that fuel prices will go up, emission limits will come down and it will become more difficult day by day to comply with regulations. This is a seri-



**START.** Paragon Shipping began trading on the New York Stock Exchange under the ticker symbol "PRGN" in 2010.

## PARAGON SHIPPING

# Company Profile

Paragon Shipping Inc., an international shipping company specializing in the transportation of dry bulk cargoes and containers, was established in June 2006. Registered in Marshall Islands, the company operates a fleet with a total carrying capacity of 747,994 dwt. Following delivery of the dry bulk and containership new-



builds currently on order, Paragon's carrying capacity will increase to approximately 1.0 million dwt and 9,600 TEU, respectively. Allseas Marine S.A.,

founded by Michael Bodouroglou in 2000, serves as the technical and commercial managing company for the Paragon fleet.

ous issue and there should be pressure placed on shipyards to come up with decent designs since shipowners have little R&D capacity. The simple reality is that shipowners are more involved in business operations than in the technical requirements of their assets.

Regulators must also understand and take responsibility for the impact of their regulations. Some proposals such as reductions in SO<sub>x</sub> emissions and the introduction of scrubbers are counterproductive. Regulations have to be practical, useful and compatible with the market conditions, and they must account for existing alternative solutions.

It is important for every shipowner that new regulations do not interfere with the lifecycle perspective of his assets so he will be able to continue using each ship for its remaining lifetime. Regulations that threaten the usage of assets should not be imposed upon ship owners as they could not make investment decisions. The IMO is in charge and should remain in charge of all shipping-related regulations.

I have doubts as to whether the industry is ready to comply with the forthcoming fuel quality regulations. Be that as it may, it is very unfair to pick on shipowners when oil companies fail to supply sufficient volumes of fuel of the required grade. Furthermore, crews are not getting any better! Cadets do not have a university degree.

Some states discourage young people from seeking a career at sea due to unfortunate legislation that regards seamen as potential terrorists or criminals, prohibiting them from entering national territory. Today, crews are from Asian countries, and the expansion of the world fleet has worsened the crew shortage. Seamen are not "normal employees", and their expectations are different. People on board

are not going to be better qualified. Complicated technology might not be the right answer in this situation. In the long run, we will need more standardised vessels, uniform ships with a simple design, bigger and with a shallower draught. Crews might not be up to complicated technology such as scrubbers, etc.

**NONSTOP:** Are retrofits an option to deal with upcoming regulations? What other technologies do you believe will be helpful in complying with regulations?

**BODOUROGLOU:** Retrofits usually do not work. They require large investments, extensive training, lots of maintenance and can even cause accidents. They can lead to many difficulties and often turn ineffective or even have the opposite result to the original intention. We oppose complex technology also due to the lack of really qualified seamen. Scrubbers are a mistake. It would be better to pay for marine gas.

Regional legislation would be a grave mistake. Shipowners are not good at lobbying. But they have to make their voice heard and inform the decision-makers about the right steps to take. The IMO is the appropriate forum for global decision-making in shipping.

**NONSTOP:** Piracy seems to be on the rise again. What can the industry do?

**BODOUROGLOU:** Piracy is causing a big headache, costs, insurance worries and cost for guards. We are converting our ships into naval vessels by placing armed guards on board. The fear of piracy is hurting crew recruitment. Re-routing is not an option. We have to remove the problem spots from the shipping routes and minimise the risk. ■ OM

# Phase II



Starting Phase II of Changxing Base development, Hudong-Zhonghua Shipbuilding makes a major step towards meeting a new, exciting target



**OOCL CANADA.** By deploying the latest shipbuilding technology developed in China, Hudong-Zhonghua Shipbuilding was awarded a prestigious prize.

**O**n 18 July 2011, the 8,888 TEU containership “OOCL Canada” set off from the Changxing Island pier of Hudong-Zhonghua Shipbuilding (Group) Co., Ltd (“Hudong-Zhonghua Shipbuilding”) in Shanghai, China. This is the second of a series of eight vessels of this type delivered to their owner Orient Overseas Container Line Ltd. (OOCL) this year. All eight are classed by Germanischer Lloyd.

Hudong-Zhonghua Shipbuilding is a subsidiary of China State Shipbuilding Corporation (CSSC), one of the two largest shipbuilding conglomerates in China. It was established in April 2001 through the merger of Hudong Shipbuilding Group and Zhonghua Shipyard. The 8,888 TEU containerships mark yet another achievement in the shipyard’s history of successfully designing and constructing high-tech





**SHIPYARD.** A panoramic view of Hudong-Zhonghua Shipbuilding.

and high value-added vessels. In 1987, Hudong Shipyard, one of the predecessor companies of Hudong-Zhonghua Shipbuilding, started building its first-ever containership. This was also the first time the shipyard built a vessel for a shipowner from the West instead of from Hong Kong, the pre-vailing East Asian shipping hub at that time.

The construction of “Berlin Express”, a 2,700 TEU containership, turned out to be a tough challenge for the shipyard. Since this was a new type of refrigerated containerships the technical requirements were exceptionally difficult to fulfil, and there was no experience to draw on; none of the other Chinese shipyards had ever built such a vessel either.

### **From 2,700 TEU to 13,000 TEU**

“There was a big gap between our technical and management capabilities and those required to build a 2,700 TEU vessel, and the shipowner was strict with regard to his technical requirements,” said Mr Wang Yong, President of Hudong-Zhonghua Shipbuilding. At that time, he was in his fourth year with Hudong Shipyard, after having earned his Bachelor’s Degree in naval architecture & ocean ▶



Photos: Hudong-Zhonghua Shipbuilding

**PARTNERSHIP.** Mr Wang Yong shows Mr Erik van der Noordaa, GL’s Chairman of the Executive Board, around the shipyard during his visit in May 2011.

## container shipping shipyard

► engineering from Tianjin University. “We finally made it, thanks to the technical assistance, technical information and onsite support of GL,” he said.

Asked about his most memorable project with GL, Mr Wang recalls how the shipyard achieved “a leap forward in terms of both technology and management” following the completion of “Berlin Express”. “There has been no real difficulty for us in building other containerships ever since. This project laid a solid foundation for us, enabling the construction of a series of containerships ranging from 1,700 TEU to 13,000 TEU,” Wang continued.

This first-ever joint project of GL and Hudong-Zhonghua Shipbuilding initiated the shipyard’s cooperation with foreign shipowners and continued partnership with GL in classification services and other fields. “GL also supports us in the development and design of containerships,” added Mr



Photo: Hapag-Lloyd

**BERLIN EXPRESS.** The 2,700 TEU vessel was the first-ever containership built at Hudong Shipyard.

Wang. For instance, since January 2009, Hudong-Zhonghua Shipbuilding has been applying GL’s FRIENDSHIP-Framework software.

### Targeting the World’s Top 10

Today, Hudong-Zhonghua Shipbuilding has grown into a world-class shipbuilding corporation that has not only constructed the above-mentioned 8,888 TEU containerships but is also the owner of the intellectual property rights to these vessels. The shipyard also built China’s first-ever 147,000-



Photo: Hudong-Zhonghua Shipbuilding

**INNOVATION.** Hudong-Zhonghua Shipbuilding constructed Xin Ya Zhou (“New Asia”), an 8,530 TEU containership, and owns the intellectual property rights to the vessel. Delivered in September 2007, the vessel was the largest containership built in China at the time. This series of five vessels was jointly classed by GL and China Classification Society, representing a good cooperative relationship between two societies and the owner, China Shipping.



cubic-metre LNG carrier. According to Mr Wang, a 13,000-TEU containership design completed recently by the shipyard's engineers is now available for sale. "We're ready for the recovery of the shipbuilding market that is expected for 2014," Mr Wang told *nonstop*. He believes the market has not rebounded yet, with ship prices stagnant and about to bottom out while the financing situation of shipowners has not looked up either. This is affecting ship deliveries and payment.

Regarding the containership market, this year has seen more than 100 newbuilding orders, with 60 to 70 per cent of them for very large containerships above 10,000 TEU. Prices have continued to slip from last year, however. "Therefore we estimate the market will not recover until 2013 or even 2014," Mr Wang cautioned.

In the face of this challenging market environment, Hudong-Zhonghua Shipbuilding has drafted a five-year strategy enabling the shipyard to grow in both size and strength. "We are pursuing a leading position among domestic and international shipbuilders in terms of efficiency. We expect to regain our position among China's top three and are striving to become one of the world's top ten yards," said Mr Wang.

### Focus on Research & Development

Even though the market has come to a low ebb, an adequate orderbook has allowed Hudong-Zhonghua Shipbuilding to keep production steady while taking advantage of this "time-out" to focus on improving efficiency and profits. Specific efficiency enhancements include optimising the system mechanics, proper disposition of various resources, improvements in the production system and flow, as well as the development and application of new technology. In addition, a cost-engineering practice has been established within the shipyard to cut internal costs. "The price is determined by the market, and it is on this basis that we determine and calculate our costs," Mr Wang continued. "Profits are boosted by lowering costs and improving efficiency."

Mr Wang also stressed the role of Research & Development (R&D) and human resources in propelling the shipyard to establish the strongest R&D capabilities among its peers in China. The shipyard boasts an R&D team of more than 1,500 experienced engineers and ship designers working in its technical center and workshops. "This is part of our

preparation for Phase II of Changxing Base," said Mr Wang. "And we expect to continue our good cooperation with GL in R&D."

### Phase II of Changxing Base

Changxing Base is Hudong-Zhonghua Shipbuilding's new yard on Changxing Island, Shanghai. With a building area of approximately 5.4 million square metres, it is almost six times as big as the old shipyard located in Shanghai proper.

Phase II of Changxing Base received government approval last August to build another two docks during its first stage. One dock is 660 metres long, 132 metres wide and boasts two 1,800-tonne cranes, the other is 580 metres long, 120 metres wide and equipped with two 1,200-tonne cranes. "Phase II of Changxing Base is a significant step towards restructuring our products and building up our competitiveness. It is our hope for the future," said Mr Wang. "It was planned and designed to high standards, its equipment and facilities are world-class, and we will be applying state-of-the-art manufacturing techniques. Therefore we expect it to operate with higher efficiency."

In the eyes of Mr Wang, Hudong-Zhonghua Shipbuilding is capable of competing with Japanese and Korean shipyards in terms of per-square-metre output and output value, given its business figures from last year. Its technology is definitely adequate for constructing high value-added vessels, but the potential for growth is constrained by infrastructure. Wang believes that Phase II of Changxing Base will help remove the constraints and enable the shipyard to participate in the competition for high value-added vessels. "Only by increasing output capacity and reducing our costs will we position ourselves to cope with the ever-rising labour costs," he said.

Phase II of Changxing Base will establish facilities for constructing large LNG carriers, large containerships, offshore engineering projects as well as some conventional vessels. Mr Wang comments: "This prospective product portfolio will expand our opportunities to cooperate with GL, especially in the area of large containerships." ■ ZL

### FOR FURTHER INFORMATION:

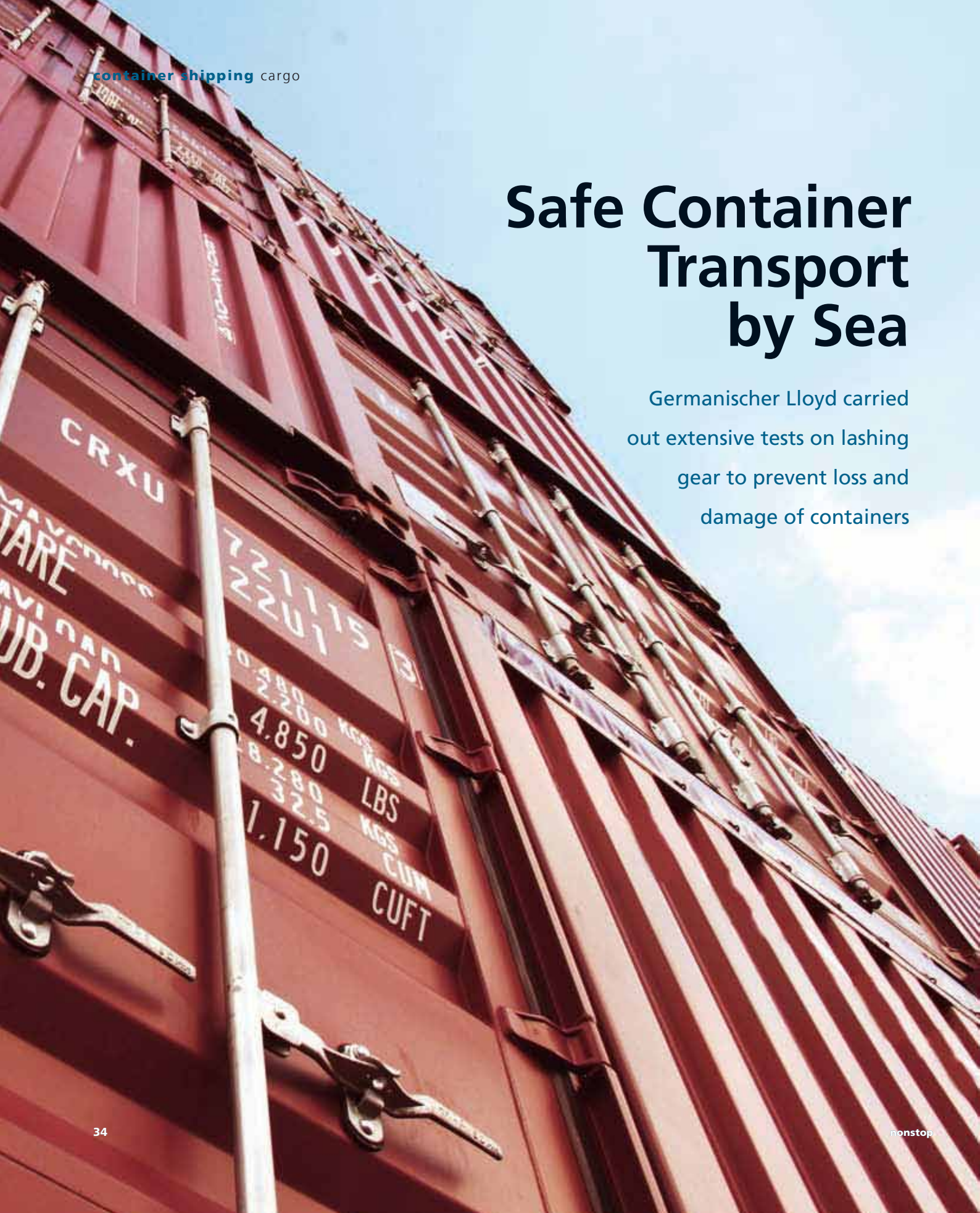
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### **FRIENDSHIP- FRAMEWORK.**

*The world's most advanced software for simulation-driven design to optimise ship hulls. This software was created by FRIENDSHIP Systems, a GL company.*

# Safe Container Transport by Sea

Germanischer Lloyd carried out extensive tests on lashing gear to prevent loss and damage of containers





Containers with wrongly declared weights represent a serious threat to the safety of containerships and their crews. The International Maritime Organization (IMO) has addressed this issue and is currently discussing whether containers should be weighed before stowage for ocean transport. Appropriate steps are to be developed by 2013 to prevent the loss of containers on the high seas. Verifying the weight of containers is, however, only one of the options for improving the level of container security at sea.

The clustering of spectacular incidents of container damage and loss in the Bay of Biscay during the course of February 2006 triggered numerous studies by the industry on the likely causes of container losses during ocean transport, which in turn directed the focus of attention to the fully automatic locks (FALs).

In connection with the development of its Rules for Classification and Construction regarding safe container transport by sea, Germanischer Lloyd (GL) conducted an intensive failure mode and effect analysis of the container stacks in the Bay of Biscay. Within the scope of the "Seaborne Container Losses and Damages" research and development project, jointly conducted with the shipping company Blue Star and the Hamburg University of Technology, Germanischer Lloyd carried out extensive calculations and measurements on six post-Panamax container carriers. Above all, the investigations showed that the container losses in the Bay of Biscay in February 2006 took place under extreme weather and seaway conditions that were beyond design limits. Here, it was possible to exclude parametric rolling as a potential cause.

### Acting Forces

In addition, the examinations on the FALs yielded crucial insights into their failure mechanisms and the corresponding influencing parameters. No fundamental malfunction of the FALs was found. However, parameters such as the condition of the container's corner castings and the container type can exert a substantial effect on the function of the FALs. What is more, lifting, compression and racking forces acting on deck-stowed containers during sea transport may also be critical for proper functioning of the FALs even when these simultaneously acting forces all remain below their permissible maximum values. Accordingly, the reliability of FALs in operation cannot be assessed solely on the basis of the permissible maximum loads. On the contrary, it is necessary to obtain adequate knowledge of realistic combinations of lift-

### STOWAGE.

During sea transport, containers stacked on deck are exposed to a variety of dynamic forces.



ing, compression and racking forces acting simultaneously under critical operating conditions.

### Numerous Model Trials

To gain insight into the stack dynamics, particularly into the actual combinations of vertical and lateral container forces, and hence to permit an adequate evaluation of the FALs in respect of their operational reliability, a new routine was developed for the transient motion simulation of flexible container stacks carried on the weather deck. In advance, full-scale and model-scale tests on container stacks subjected to dynamic excitation were conducted within the scope of the joint industry project "Lashing@Sea". Moreover, Germanischer Lloyd performed further static tests on ISO standard containers to gain well-founded information regarding significant system parameters. Test data obtained from both test series served as a validation basis for the finite element model and confirmed the model's capability to adequately calculate sea-induced container and lashing forces, taking into account various dynamic effects. Various representative configurations of container stacks carried on the weather deck were systematically analysed, utilising the newly developed method for stack motion simulation. Relevant parameters – such as container flexibility, cargo distribution within the container stack, clearance in the locking devices, and lashing rod pre-tension – were considered in the simulations.

In particular, the numerical results revealed that the wind and sea-induced lifting, compression and racking forces acting on the container and locking devices depend strongly on the container's flexibility. Whereas the simulations yielded a largely uniform distribution of the racking forces on the container's door-end frame and the front-end frame, the lifting and compression forces loaded mainly the locking devices and the container corner posts at the front end. ▶

### FALs.

*Fully automated locking and unlocking mechanisms cut the time spent in harbour significantly while improving safety.*



**RESULTS.** The lifting, compression and racking forces acting on containers and securing equipment depend on the flexibility.

- This non-uniform distribution of vertical loads is a consequence of the relatively high racking flexibility of the container's door-end frame. Therefore, high simultaneously acting lifting, compression and racking forces are typical for the container's front end, especially for the lower tiers.

### Two Design Load Combinations

So far, load combinations consisting of high lifting, compression and racking forces were used as standard test loads for locking devices. These tests focused on the locks' failure by vertical "pull-out" from the container corner casting, typically accompanied by considerable material abrasion at the corner casting. This design load case was based on the assumption that any tipping of the container stack as a result of wind loads and ship rolling causes equal lifting, compression and racking forces on the container's door end and front end.

In addition, simulations revealed that load combinations of high lateral forces acting simultaneously with low vertical forces occur at the door end. Such load combinations are also critical for the FALs. For this load combination, the FALs slide out sideways without damaging the corner castings significantly, because of the low friction forces and their inherent lack of form-lock. For this reason, such load combinations must be taken into account as an additional design load case when testing FALs.

Both design load cases, each characterised by a critical combination of realistic values for lifting, compression and racking forces acting simultaneously, were determined on the basis of the new findings achieved with the new simulation procedure and constitute the basis of GL's new approval procedure for FALs.



Photos: Dreamstime/Helder Almeida/John Mathys/Gary Blakeley

**CONTAINER CORNER CASTINGS.** Corrosion and wear are common problems.

This test procedure, which consists of a test against the lock's vertical pull-out as well as a test against the lock's lateral slide-out, considers the special features of the FALs. Besides realistic load combinations, relevant influencing operational parameters, such as manufacturing tolerances for containers and corner castings, were taken into account by the corresponding test setup. In addition to the standard strength tests, these two new test cases belong to the scope of approval for the proper functionality of locking devices.

### Changed Roll Response

In addition to the examinations and developments for containers and securing elements described above, ongoing activities focus on the validation of the ship's design accelerations as input for the calculation of lashing forces. Due to the current widening of the Panama Canal to a width of 55 metres, container ships are increasingly being built with a greater beam, which means that the ratio of ship length to ship width will decrease for the global fleet of container-ships. Specifically, the increasing ship width affects the ship's roll response in a seaway, which has a crucial influence on the lateral accelerations acting on the containers stowed on deck. The rules need to take this fact into account by providing design values to avoid lengthy ship-specific numerical computations. Furthermore, the effect of slamming-induced lateral and vertical accelerations of the elastic hull girder is currently the subject of ongoing investigations. ■ HR

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## New Service Tool for Cargo Planners

Some goods consigned for international transport are classified as hazardous – they might, for example, be toxic to humans and/or the environment, explosive, flammable or radioactive. Each mode of transport – inland waterways, sea, air, road and rail – has its own safety requirements in the form of an international convention or code based on the UN Model Regulations that regulates the transport of such goods across international borders.

Safety concerns involved in shipping chemicals and other hazardous goods by sea are reflected by a new amendment to SOLAS II-2/19 “Carriage of Dangerous Goods”, which spells out requirements for appropriate on-board equipment. With the new amendment in force since 1 January 2011, Germanischer Lloyd (GL) launched an online database service called “GL Cargo” to provide users with easy access to all applicable requirements related to on-board equipment for the transportation of hazardous goods.

Friedo Holtermann, Marine Engineer at GL, explains benefits of the new database: “With the GL Cargo online interface, a user can tick off the types of cargo space and goods classes and then leave the remaining work to our system, which automatically generates a report on all applicable requirements regarding cargo holds and equipment, such as the fire extinguishing system, water supply, ventilation, detection system, etc. With this tool, it is no longer drudgery for cargo planners to figure out specific requirements they have to fulfil, because a comprehensive report can be produced addressing any type of dangerous goods their vessels will transport.”

The GL Cargo database accounts for all provisions of SOLAS II-2/19 adopted by Resolution MSC 269(85), as well as the revised standard format for the Document of Compliance for the Carriage of Dangerous Goods according to MSC.1/Circ.1266. It

covers all kinds of dangerous goods, whether in packaged form carried by multi-purpose vessels, containerships or RoRo vessels, in solid or in bulk form shipped by bulk carriers or multi-purpose vessels. GL Cargo can also be used to generate and print out the Document of Compliance in the new standard format once the required information about the type of space and the classes of goods has been uploaded to the database. “This brings further convenience to our clients and GL alike,” Friedo Holtermann adds.

GL has been authorised by major flag state administrations to provide the new Document of Compliance after conducting appropriate surveys and reviewing documents and drawings of a given ship. Existing documents for ships in service will remain valid until they are routinely re-issued for a change of flag or class renewal. GL has developed additional tools enabling its clients to comply with a variety of rules and regulations in a convenient and time-efficient way. These tools are available on GL’s corporate website.

For further information: [www.gl-group.com](http://www.gl-group.com)



**SOFTWARE.** GL Cargo makes it easy for planners to figure out specific requirements they have to fulfil.

First of all, on behalf of the COSCO management, I'd like to extend my sincere congratulations to GL for this important milestone," said Dr Sun Jiakang, Executive Vice President of China Ocean Shipping (Group) Company ("COSCO") in an interview with *nonstop* in early August. This was the first remark made by Dr Sun when he learnt the total tonnage of GL-classed ships has hit the 100-million-GT mark.

For COSCO, the year 2011 was also special. In April, the shipping giant celebrated its landmark 50th anniversary of its founding, with more than 1,100 distinguished guests from

China and overseas gathering in Beijing to witness the moment.

COSCO had a humble start back in April 1961 when it was founded as a shipping company owning merely four vessels, equivalent to no more than 22,600 dwt tonnage in total. Today, COSCO owns and operates over 800 modern merchant vessels with a total tonnage of 57.6 million dwt. Ranked first in China and second in the world in terms of fleet size, COSCO runs the world's largest dry bulk fleet and the fourth largest container fleet. It also has high rankings in oil tanker, multi-purpose vessel and special vessel fleets.

C O S C O





In just half a century, COSCO has become one of the major multinational enterprises and a Fortune Global 500 company with a diversified business specialising in global shipping, terminals, modern logistics and shipbuilding and ship repair. This is a phenomenal achievement, by any measure.

### Oceans of Demands

Dr Sun attributed the success to the painstaking efforts by many generations of COSCO's staff, combined with the foresightedness of the management, as well as the opportunities arising from China's reform and opening-up policy

**JUMBO.** The 9,500 TEU containership "COSCO HELLAS" is one of a series of five vessels classed by GL. Among the largest containerships in the world, all five received GL's Operational CO<sub>2</sub> Index Certification.



Photo: COSCO

# Ploughing the High Seas

Following its 50th anniversary celebrations, COSCO has set sail to fulfil its aspiration of building up a "Centennial COSCO" and setting new yardsticks

over the past thirty years and the support of its business partners.

As COSCO's fleet grows bigger and bigger, it is high on the agenda to find a way to navigate steadily and steer clear of "submerged reefs". A diversified business has helped COSCO to mitigate the potential risks resulting from the cyclical nature of the shipping sector. "We've expanded into shipbuilding and repairing and some other sectors that are less cyclical or even countercyclical to the shipping business. We manage to hedge the risks by exploring complementary sectors," said Dr Sun. "In addition, we've held stakes in some financial, energy and resource businesses to benefit from the boom in these sectors."

When asked about the biggest challenges facing COSCO in the future, Dr Sun pointed out they lie in "your cognition of the market development being correct, your responding measures being effective and doing your business following the rules of the market". COSCO successfully defined the correct response to challenges during the financial and economic crisis in 2008.

"Since 2007, we have believed in 'cash is king' principle. At peak times, our cash in hand was RMB 90 billion, which gave us a solid financial foundation," Dr Sun ▶

► recalled. While boosting its container bookings, COSCO focused on lowering costs through lean management. "And we didn't sack a single worker but chose to sail in the same boat. Therefore, the staff morale was very high. After all, the drive of our workers is everything," said Dr Sun.

It seems the global shipping business has not yet shaken off the shadow of the financial crisis, with the Baltic Dry Index (BDI) slipping to some new lows for consecutive days recently. As for Dr Sun who has been in this line of business for nearly 30 years, he just regarded this movement as "twists and turns in the course of recovery" or "a temporary imbalance of supply and demand". "In the long run, I am optimistic of the shipping market. As long as oceans still exist, so do the demands for ocean shipping," he declared, confidently.

### Green Consensus

Both COSCO and GL have made environmental protection part of their corporate missions and see it as a major obligation for a good corporate citizen to fulfil. For the shipping business, increased energy efficiency and reduced fuel consumption are powerful levers to protect the environment. Both companies have made considerable contributions to this objective by developing and applying environmentally friendly technologies.

Slow steaming is an important area of consensus highlighting both parties' constant pursuit of greener shipping. GL has long been advocating slow steaming as an effective tool to cut overcapacity and CO<sub>2</sub> emissions. COSCO is also an advocate of and pioneer in practising "super-low steaming." In January 2008, COSCO Container Lines took the lead to reduce its fleet speed by 10 per cent. "After taking three measures to cut the speed from 2008 through 2010, we



**EXPERT.** Executive Vice President Dr Sun Jiakang began his career with COSCO in 1982.

Photos: COSCO



**BREAKTHROUGH.** "COSCO Teng Fei" is the largest car carrier China has independently designed and built. Delivered in 2011, it is capable of carrying 5,000 cars.

managed to lower our annual fuel consumption by 400,000 tonnes, equivalent to saving 200 million dollars per year," said Dr Sun proudly. "We also reduced our CO<sub>2</sub> emissions by 1.2 million tonnes a year as well as our sulphur emissions even though this is not mandatory. Therefore, the social and economic benefits of this programme are significant." Currently, the speed of COSCO's container fleet has been reduced from 25 knots to between 17 and 14 knots.

GL's innovations, especially in green-shipping technology has made a deep impression on Dr Sun. "GL is at the forefront in the development of the industry's leading technology and, in particular, an industry leader with several ship types related to green shipping," he said. "I feel that GL could fulfil just about any requirements and concepts you one could come up with. We appreciate GL's technological know-how."

"Greener" is included in GL's corporate mission and its statement goes like this: We apply our knowledge to inspire our clients and colleagues to lower their environmental impact and help shape a greener future. Sharing the same view, COSCO has taken the responsibility of involving other market players in the green cause. In November 2009, COSCO initiated an announcement in Qingdao together with other members of CKYH alliance (COSCO, K-Line, Yang





**STILTS.** In 2010, COSCO Nantong Shipyard delivered a self-elevating drilling unit for Remedial Offshore.

**ENERGY.** COSCO Nantong Shipyard delivered the world's most advanced wind turbine installation (WTI) vessel "MPI Adventure" in 2011, the first generation-2 WTI vessel ever built in China.

Ming and Hanjin) to implement a super-slow steaming programme. In November 2010, COSCO enabled the signing of a Guangzhou announcement with the world's top ten ports to develop green and low-carbon logistics. "COSCO spares no efforts in our pursuit of greener shipping and greener ports," Dr Sun stressed.

### A Big Heart

In fifty years, COSCO has grown into a multinational company, with its overseas assets and income accounting for 56 per cent and 50 per cent of the total, respectively. Talking about potential expansion in the future, Dr Sun believes business scale is second to business performance and profitability in terms of importance. "We seek to allocate our resources on a global basis to maximize the returns for our shareholders," he said.

As Dr Sun pointed out, COSCO will continue its efforts for further moderation and explore new ship types, such as refer carriers, wood scrap carriers, other special vessels, etc. "We will do research as regards these vessels in support of our clients' needs," he said. "We also hope to join with GL in the research and development of some special and innovative ship types by pooling our respective strengths. I see this

as our mutual commitment to the maritime industry." Meanwhile, the multinational has a bigger picture in mind. "If GL has any new technology to bring into the Chinese market, COSCO is willing to be the first to try it out. We would be the spearhead in driving forward China's shipping industry as a whole," said Dr Sun. During the 50th anniversary celebration, Captain Wei Jiafu, President and CEO of COSCO, declared a strategic goal for COSCO to become "a cluster-leading shipping company" by 2020, demonstrating its high ambition to prosper together with the shipping industry and the other related industries.

As new Chairman of GL China Committee, Dr Sun expressed his wish that the Committee could become "the most active GL Committee" worldwide and play a role in helping GL to share the fruits of the dynamic growth of China's shipbuilding industry. "By working together with other committee members, I have the resolution and confidence to assist GL in achieving a better performance in China," he concluded. ■ ZL

### FOR FURTHER INFORMATION:

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**OFFSHORE.** COSCO has explored the offshore sectors and made a name for itself through many exceptional projects. An example is the world's first cylindrical drilling unit "Sevan Driller".



# Holding Steady in Rough Seas



## Amid the uncertainty currently afflicting their country's financial future, Greek shipping companies stand as one of the strongest pillars of their national economy. Panos Laskaridis, the Managing Director of the Laskaridis Shipping Group, analyses the situation from an industry perspective

**NONSTOP:** Mr Laskaridis, what are the implications of the Greek financial crisis for the Greek shipping industry?

**PANOS LASKARIDIS:** The Greek shipping industry is not directly affected; it actually makes a positive contribution to the national economy of around 15 to 20 billion euros a year. As the biggest contributor of foreign currency to the Greek economy by far, it promotes the image of Greece as a world power in this field. Its direct and indirect investments are quite successful. Of course these are challenging times for all of us, and market conditions are extremely volatile.

**NONSTOP:** What is Europe's role in the Greek Crisis?

**LASKARIDIS:** The EU member nations had no mechanism to deal with such a crisis, and no common position on Greece. There are many different opinions within countries, parlia-

ments, governments and banks. If we want to restructure the Greek economy, change will be inevitable. But I have my doubts about the solutions suggested so far. A grant or loan payback mechanism makes sense, but it would not be a good idea to apply a shock therapy to the Greek economy, which is small and vulnerable.

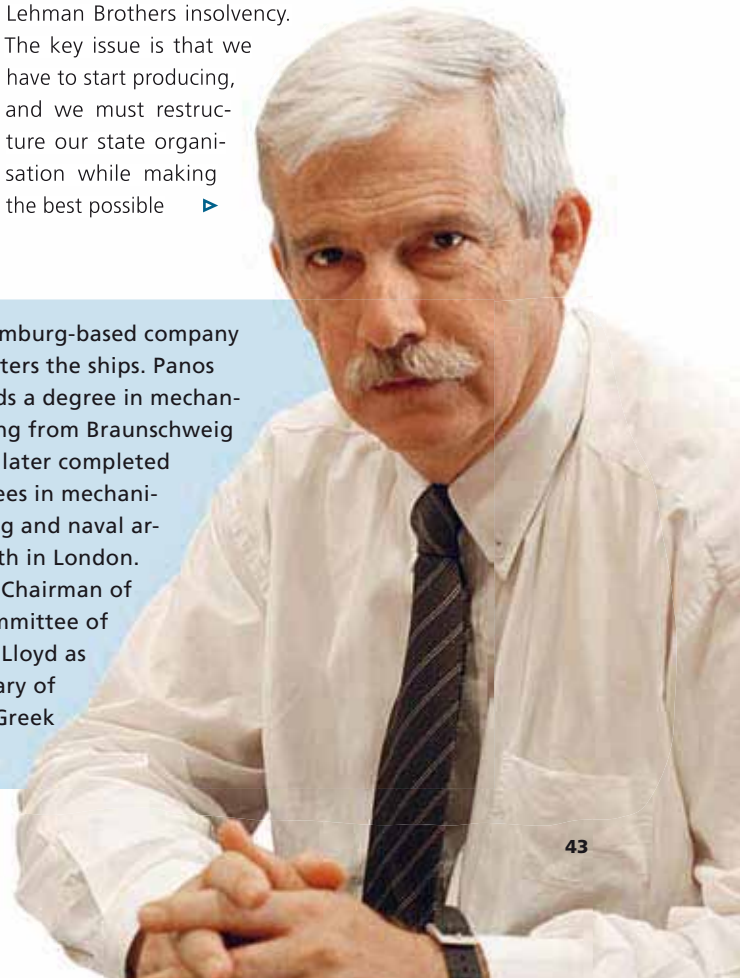
All stakeholders are afraid that if Greece collapses it might have similar effects as the Lehman Brothers insolvency. The key issue is that we have to start producing, and we must restructure our state organisation while making the best possible ▶

### PROFILE

## Panos Laskaridis

The Athens-based shipping company specialises in ocean fish transportation and bunker supply services. Other areas of business activity include shipyards, coastal shipping, hotels as well as Aegean Airlines. In Hamburg, the enterprise holds the reefer pool Alpha Reefer Transport operating about 50 vessels, half of which are owned by Laska-

ridis. Their Hamburg-based company Frigoship charters the ships. Panos Laskaridis holds a degree in mechanical engineering from Braunschweig University. He later completed Master's degrees in mechanical engineering and naval architecture, both in London. He is the new Chairman of the Hellas Committee of Germanischer Lloyd as well as Secretary of the Union of Greek Shipowners.



► use of European financial aid. If we manage to turn things around, recovery could be much quicker than in other countries. This is also in essence the package agreed on at the last European Summit in Brussels recently.

**NONSTOP:** What is the role of shipowners in the Greek recovery?

**LASKARIDIS:** Greek shipowners are actively investing in Greece, for example in the property market. The coming wave of privatisation of state-owned infrastructure and enterprises will provide more opportunities for investment.

Privatisation alone, however, will not resolve the crisis, and it is coming a bit late. Its effect on the debt situation will be limited unless it is backed by real structural reform of the political system, state organisation, our bureaucracy and our attitude. The idea that dramatic changes are necessary is slowly gaining ground. But changing a habit that has gone on for decades is not easy. We need to downsize the government and public administration apparatus.

**NONSTOP:** What can the Greek government do to support the shipping industry?

**LASKARIDIS:** Greece is not enjoying the same advantages that other maritime hubs like Singapore, Hong Kong, Shanghai and Cyprus can offer. If the economic framework is changed in a way that leads to competitive disadvantages, our shipping industry might move elsewhere.

Greek shipowners produce tangible benefits for the national economy and the political leaders of Greece should allow it to continue to do so. The Greek shipping industry should be left alone since it is best positioned to place Greece in a global top position.

**NONSTOP:** Overcapacity has been a problem in your market. How did this arise, what does the market look like now?

**LASKARIDIS:** We Greek shipowners are not well known for our collective wisdom. When freight rates were at their peak, we were all carried away ordering ships without considering the price, the class and other factors. We believed the boom would continue forever. Personally I had my doubts. And the collapse of Lehman Brothers in 2008 showed how fast these prospects can evaporate.

In the end, the number of cancellations was small, but there remain a lot of slippages and overcapacity. Newbuilding prices have come down to reasonable levels. Scrapping



of old ships and fleet renewal continue. Of course this varies between market segments.

**NONSTOP:** What are the prospects for the container market?

**LASKARIDIS:** Container shipping generates a good, predictable steady cash flow. Since it requires massive investment, it implies a long-term engagement. The current low building prices make container shipping attractive. Container traffic is likely to grow in the years to come so the prospects continue to be positive. Some owners may consider their vessels as a long-term investment while others may sell them when the opportunity arises, similar to the tramp market.

**NONSTOP:** What are current challenges for the shipping industry?

**LASKARIDIS:** We have enjoyed an extraordinary business cycle, but the global business environment has changed considerably in the last three years. Key and operational challenges for our industry are emission reductions and energy efficiency as well as the related regulations, not to mention, the rise in piracy. However the biggest challenge is the development of the world economy and the supply and demand equation.

**NONSTOP:** What do you recommend regarding piracy?

**LASKARIDIS:** Piracy is a huge concern for shipowners. I am afraid the situation may get out of control unless the stake-



*Key commercial challenges for our industry are emission reductions and energy efficiency as well as the related regulations, not to mention the rise in piracy.*

**PANOS LASKARIDIS**

Managing Director, Laskaridis Shipping

holders develop a comprehensive solution. The leading trading nations seem to understand the need to combat piracy effectively. The efforts by NATO, as much as they are appreciated, are not enough.

There is a very real danger that sea trade will be disrupted by crews refusing to board vessels for routes between Europe and Asia. The Philippines, India and other seafarer nations are apparently drafting legislation for safeguarding their citizens and their right not to be exposed to grave risks to their health and wellbeing.

Greek shipowners consider armed guards on board a viable solution to protect the crews, ships and cargo. As far as I know, no vessel with guards on board has been successfully hijacked. The Union of Greek Shipowners is proposing legislation to allow shipowners, masters and crews to opt for armed guards on board. The Greek flag has not been in favour of this, but in view of the overwhelming need to protect ships' crews, a change of the law may come.

**NONSTOP:** What is your position in the current environmental debate?

**LASKARIDIS:** The Greek shipping industry firmly believes that since shipping is a global industry, environmental regulation also should be implemented globally. We are pushing for a stronger role of the IMO. Europe is taking its own approach, while the US and the rest of the world seem inclined to give the IMO the decisive role to provide a global solution.

Shipping certainly has a role to play in reducing environmental pollution, and I think we have already made some progress. However, this is a very complex area, and shipping needs to be viewed in the context of other industries. The approaches also vary not only between industries but between countries; developed and developing countries have rather different perspectives on the issue. There are two ways to deal with the environmental challenges: technical

solutions and market-based measures, such as the fuel levy and the Emission Trading System (ETS).

Greek owners are in favour of a levy solution. To me, the ETS seems to lack transparency and would be difficult to administer. The EEDI is better than nothing, but also flawed in many respects. A solution acceptable to all parties seems to be a long way off although the IMO recently decided on the EEDI. Several inconsistencies related to size and speed still need to be clarified.

**NONSTOP:** What should the role of classification societies be, given the regulatory initiatives that are changing the operating environment?

**LASKARIDIS:** The role of classification some ten years ago was strictly limited to statutory and classification matters. Any other activity raises eyebrows in the shipping industry. In recent years, classification societies have become more involved in consulting activities.

Personally I have no objections to this, provided that the shipping industry is included and consulted in the development of new products and services. Engineers might not be able to evaluate the long-term commercial implications of their ideas that might look great at the beginning; I think this is where an industry perspective is most valuable.

**NONSTOP:** Given the diversity of your business activities, have you been evaluating opportunities in renewable energy?

**LASKARIDIS:** It is a very promising area because investment costs are coming down dramatically. Greece has great opportunities but until now there have been limited investment incentives in Greece due to the financial situation and heavy bureaucratic and administrative burdens.

Our group is involved in hydropower, solar and wind farm projects. Financing for these comes from a mix of foreign and local sources. ■ **OM**

# GERMANIA

Rebirth of a Legend





# NOVA

**ALL NEW.**  
103 years after the launch of the legendary schooner yacht "Germania", her exact replica "Germania Nova" is now under sail.

Photos: Hasso Hoffmeister



Photo: Aquilo Ltd.

**K**iel Week 1908: The newbuilding of the racing topsail schooner "Germania", built at the Krupp yard in Hamburg, scooped all of the silverware at the racecourse. Under the disbelieving eyes of the foreign competition, the yachts of world-renowned designers such as Vanderbilt and Herreshoff we are humbled by the creation of a new star in the yacht design firmament, Max Oertz. The "Germania", intended to be a "German ship through and through", was not the first attempt by the German expert;

Just over 100 years after the launch of the original "Germania" the ship celebrates her resurrection as "Germania Nova". The racing topsail schooner was classed by GL

he had already designed the famous "Meteor" yachts for Kaiser Wilhelm II.

The end of the 19th century and beginning of the 20th can certainly be considered as the golden age of yacht building worldwide. It was only 100 years later that the dimensions of those years were reached again – after all, the "Germania" measured all of 60 metres in length overall. The sailing performance of these schooners was the product of an evolutionary process. Careful trial and error with the ▶

► painstaking collection of experience over decades distinguishes these ships from their workaday cousins, the fishing schooners. Even in those early times, it was already important to be faster than the competition.

Wartime and the post-war years put a stop to the burgeoning yachtbuilding scene all over the world; the “Germania” met its own cruel fate in a tropical storm and sank off the coast of Florida; today, the wreck is a listed monument.



**SHEER SKILL.** A crew of 13 is needed to handle the rigging of the “Germania Nova”. At very first trial project manager Detlev Löll took the helm. Her future master will be the Englishman John Barton.

### Top Secret

Peenemünde 2008: Detlev Löll’s telephone rings. The caller plans to reanimate a legend. At the shipyard Factoria Naval in the sleepy Spanish port of Marin on the Galician northwest coast, everyone has been sworn to secrecy. Under the technical direction of Detlev Löll, a recognized expert for traditional ships, more than two years were expended in planning and building an exact replica of the “Germania”. Not only does the “Germania Nova” look just like its famous predecessor, even the rigging was implemented without resorting to modern technology – well, almost, because some of the winches are hydraulically powered. Despite this, a crew of at least 13 is needed on the “Nova” to set and trim the sails. There is no comparison to modern craft such as the Wally yachts, on which the second and third man is needed almost only for port manoeuvres, as everything is automated.

On the evening before the planned sea trial, GL naval architect Hasso Hoffmeister came aboard for the first time. The magic exuded by the yacht is tangible. Next to none of the original technical documents had been available to the project team for their planning work. They had to pore over archives and photo collections. And now she has been re-born. The unusual setting for a yacht – a shipyard – did not rob the elegant vessel of its aura; it seemed to float above the humdrum surroundings.

Hoffmeister’s task was to subject the rigging to a final inspection. This examination has to be passed if the GL Rig Design Certificate is to be granted. After several months of analyses, calculations and computer-aided simulations, the rig concept was thoroughly tested according to the state of the art. This was followed by plan approval of the components as well as construction supervision at Ventis, a Dutch specialist for wooden masts. The rig was now standing ►

### EXACT REPLICA.

“Germania Nova” is a near-exact replica of the original ship, both technically and by appearance. For the design and construction of the ship the engineers had to rely on historic photo collections and documents from private archives.







► where it belonged, perfectly set up by a German expert. For the “Germania Nova” the forthcoming trial was the first real test, as she had not yet been tried out under sail. The atmosphere around the team leaders was so tense that it could be cut with a knife. Yard workers were still busy making the boat ready for sea. Sea trials at such an early stage can often be held up by relatively minor issues.

### Professional Preparation

9.15 a.m. – “Germania Nova” casts off. Here the yard’s captain was only a spectator. He has no experience with sailing yachts, so the future master, John Barton from England, took over at the helm. The bay of Marin, which is more of a fjord, is lined by beaches and villages.

The entrance to the fjord is littered with numerous islands, which protect the fjord from the Atlantic swell. After passing these islands, the brand-new sails were set at long last. First the mainsail: fastened to a gaff and a hollow wooden boom, measuring an impressive 26 m in length and jutting 4 m over the stern of the yacht. With an area of 450 m<sup>2</sup>, the mainsail is the largest on board, after the spinnaker. With a full rig, the eight plain sails add up to a majestic 1,200 m<sup>2</sup>. One after the other, they were carefully set. Although the crew had gained its sea legs on schooners, every boat is different and each has its own personality. Perfect coordination of the manoeuvres is vital.

**PARADIGM.** Saloon, ladies’ parlour, galley – below deck, the “Germania”, a highly successful racing yacht, offered a comfortable ambience. Emperor Wilhelm II, highly impressed, had his new yacht, “Meteor IV”, modelled after the “Germania”.



Photo: Hasco Hoffmeister





Thanks to the professional preparation and meticulous work by the yard, project manager and participating companies, the “Nova” was soon moving out into the swell of the Atlantic under full sail. With up to 15 knots of wind and a long swell from the north, conditions were ideal for trials. In addition to the working sails, both topsails, all three headsails and a staysail had been set by now. Slowly the skipper took the yacht closer to the wind, and the sheets were carefully hauled tight. So many components have to interact properly; every single link in the chain of action is essential.

The ship heeled on its side for the first time. The sheets were hauled even tighter. Spray explodes over the foredeck. For those privileged to experience this all at first hand, it is a truly exciting moment when the “Germania Nova” pulls her lee gunwale through the water. My mind’s eye was immediately filled with the old black-and-white photo of the original “Germania”: an instant in time harking back over 100 years, frozen on celluloid, had finally been brought back to life.

GL’s trial programme of jibbing and tacking, setting and trimming the sails, and observing the structure was passed with the effortless elegance expected of this stately vessel. ■ HH

**FOR FURTHER INFORMATION:**

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**HISTORY**

## A German Ship

“German from the keel to the truck” was what the designers of the schooner yacht “Germania”, built in 1908, demanded. That requirement was met, with the exception of the masts which were made of Oregon pine imported from the U.S. “Germania” was the wedding gift of Bertha Krupp, heiress of the famous German steel empire, to her husband Gustav Krupp von Bohlen.

**TECHNICAL DATA**

## “Germania”

<b>RIGGING TYPE:</b>	Schooner
<b>SAIL NUMBER:</b>	A 3
<b>DESIGNER:</b>	Max Oertz
<b>YEAR OF MANUFACTURE:</b>	1908
<b>SHIPYARD:</b>	Friedrich Krupp Germaniawerft
<b>SHIPYARD LOCATION:</b>	Kiel-Gaarden
<b>HULL MATERIAL:</b>	Steel, smooth-riveted
<b>DECK MATERIAL:</b>	Wood (white pine)
<b>MAST MATERIAL:</b>	Wood (Oregon pine)
<b>BUILDING &amp; OUTFITTING COST:</b>	704,024.41 german Goldmarks
<b>LENGTH OVERALL:</b>	47.21 m
<b>LENGTH INCLUDING BOWSPRIT:</b>	55.16 m
<b>LENGTH (WATERLINE):</b>	32.94 m
<b>BEAM:</b>	8.17 m
<b>DRAUGHT:</b>	5.41 m
<b>GROSS TONNAGE:</b>	191.5 GRT
<b>DISPLACEMENT:</b>	250 tonnes
<b>MAINMAST HEIGHT:</b>	49.60 m
<b>SAIL AREA CLOSE-HAULED:</b>	1,313.29 m <sup>2</sup>





# Strengthening Skills

Advanced training is key to personal, professional and corporate success.

The GL Academy has been serving the maritime industry and other sectors for over 16 years, delivering a broad portfolio of courses and seminars

**N**o question – employees are among the most important resources any enterprise can invest in. Continued education is a key factor for business success. For more than 16 years, the GL Academy has been offering a comprehensive, expanding range of training opportunities, from seminars on standard topics to customer-specific, in-house courses.

## **New Courses – New Developments**

For its 2011 portfolio, the GL Academy has sharpened its focus on the requirements of the STCW (Standards of Training, Certification and Watchkeeping) Convention and the environmental agenda with new seminars on topics such as the Energy Efficiency Design Index (EEDI), gas as a ship fuel or

air pollution from ships. Another long-awaited new GL Academy seminar, a superintendent training course, was introduced in Manila in March. Its 16 inaugural participants spent five days acquiring crucial knowledge and skills needed to tackle the challenges of their jobs as marine superintendents. GL Academy Manila, established just last year, has been welcomed enthusiastically by the local shipping community and has become one of the first points of contact for customers looking for advanced training.

One of the latest developments at the GL Academy is a three-day course titled “Train the Trainer for Shipping Companies”. It will first be held in Hamburg in September, followed by three other countries. The STCW Convention requires that any person teaching certification classes for sea-





Photo: iStockphoto/mediaphotos



**SUCCESS STORY.** At 21 local sites worldwide, GL Academy offers its standard seminars and custom-tailored programmes. A “Train the Trainer”-seminar for shipping companies is one of the latest developments at GL’s advanced training institute.

farers must be appropriately qualified. This course is specially designed to support the implementation of regulation I/6 of the STCW Convention concerning the qualification of instructors. After completing the course, the participants will be qualified to teach maritime competence-based courses applying current methods and using advanced teaching aids.

### Successful Cooperation

The GL Academy’s market presence is enhanced by roughly 20 cooperation agreements with academic and maritime organisations worldwide. In Mumbai, the GL Academy India maintains ties with several cooperation partners, including the ISF Maritime and Offshore Institute and the Mumbai and Marex Media Pvt. Ltd.

Established in 2009, GL Academy India has been very well received by the local industry. Jointly with its local partners, the GL Academy offers a seminar programme focusing on topics that will keep the maritime community abreast of the latest developments.

Courses custom-tailored to the specific needs of individual corporate clients are part of the GL Academy’s offerings. For example, GL Academy India delivers various courses to Great Eastern Shipping Co. Ltd., India’s largest private sector shipping company, on a regular basis, including a “Performance Enhancement Course for Deck Officers at the Operational Level” and “US Environmental Violations – How to prevent prosecution and penalties”.

### Government Support

In some regions, specific GL Academy seminars are now subsidised for local participants. For example, maritime companies in Singapore send their employees to pre-approved GL Academy maritime training courses co-funded and supported by the Maritime and Port Authority of Singapore. This confirms that the GL Academy’s continuous investment in quality training is generally acknowledged.

### Responding to Local Needs

Different countries and markets have different needs, and the GL Academy keeps an open mind for the specific requirements of local markets. Apart from its standard, worldwide seminar programme, the GL Academy develops special courses in response to local demand wherever the need arises. In Brazil for example, GL Academy São Paulo has successfully held management system seminars tailored specifically to the Brazilian health care system. All country-specific programmes are adapted to the respective local requirements in terms of content and language.

### Joining Hands with GL Garrad Hassan

GL Garrad Hassan, an authority in the renewable energy field enjoying worldwide recognition, has been offering an advanced training programme of its own for many years. As a member of the GL family of companies, GL Garrad Hassan is now joining forces with the GL Academy to combine ▶



**PORTFOLIO.** The training institute's 2011 agenda focuses on environmental topics such as efficiency in ship design.

► the expertise and activities of two powerful advanced training networks. GL Garrad Hassan contributes its technical knowledge in wind, wave, tidal and solar power to GL Academy's experience and status as an established global provider of maritime, industrial and management systems training. A number of joint training seminars in the field of wind energy are now being offered. By enabling GL Garrad Hassan's skilled trainers to work within the GL Academy infrastructure, and through the GL Academy's local branch offices, these combined training programmes are made available worldwide. Customers benefit from one-point, local access to all external training activities.

### Working across Borders

No other industry is as globalised as the shipping business. A typical situation for the GL Academy might look like this: a customer headquartered in Dubai asks for in-house training, but the staff he wants to be trained is located in Korea. No problem for the GL Academy whose local offices form a global collaboration network extending across all national borders: GL Academy Dubai and GL Academy Busan will liaise to coordinate the training courses jointly. A recent example was a training programme provided for the crew of a large, newly-built container vessel. Customers benefit enormously from this close-knit infrastructure that ensures equal quality standards around the world.

### The Network Keeps Growing

The most recent additions to the network of GL Academies, the Szczecin (Poland) and Benelux offices, have brought the total number to 21. It had all began in 1995 with the opening of the first academy in Hamburg, and it was not until 2008 that the second office followed in Greece. Since then, however, the network has expanded rapidly across the globe. As new coordinators join the existing team of experienced GL Acad-

**FOUNTAIN.** *GL Academy started its service in 1995 in Hamburg. Since 2008 the international network has expanded fast.*

emy leaders managing local academies, the pool of experts and expertise continues to widen and deepen, and a lively exchange of knowledge and best practices continues across the network. In addition, the coordinators meet regularly for regional workshops, both virtual and face-to-face, to improve the services offered to their clients and further develop GL Academy's advanced training programme.

Today there are GL Academies in Cyprus, Italy, Spain, Turkey, Scandinavia, Japan, China, Dubai, India, Korea, Singapore, the Philippines, Brazil, USA, Mexico and Peru, in addition to the ones in Hamburg (Germany) and Greece. All of them are ready to provide customers with innovative and comprehensive training services, living up to the GL Academy's motto: "Where Experts Learn More". ■ US

#### ACADEMY

## International Network

- In 2010 more than 5,900 professionals participated in nearly 600 GL Academy courses worldwide.
- The enormous popularity of GL Academy seminars around the world has led to the establishment of 21 local academy sites, each of which offers the full gamut of GL standard seminars plus specialised programmes custom-tailored to the specific needs of the region.
- Today a network of well over 300 expert trainers stand ready to share GL's accumulated knowledge and expertise with industry professionals.

**FOR FURTHER INFORMATION:** GL Academy, Phone: +49 40 36149-195  
E-Mail: gl-academy@gl-group.com



# GL Academy – Dates at a Glance

Selected seminars in 2011 – information and registration: [www.gl-academy.com](http://www.gl-academy.com)

## SEPTEMBER

12. – 14.09.11  
**Train the Trainer for Shipping Companies**  
Hamburg, Germany

13. – 14.09.11  
**The IAMSAR Course**  
Hamburg, Germany

14.09.11  
**Gas as Ship Fuel**  
Copenhagen, Denmark

15.09.11  
**Latest Amendments to Maritime Regulations**  
Shanghai, China

19.09.11  
**Emergency Preparedness and Crisis Management**  
Long Beach, USA

19.09.11  
**Energiemanagementsysteme EN 16001 Normgrundlagen**  
Hamburg, Germany

19. – 23.09.11  
**Superintendent Training Course**  
Singapore

20. – 22.09.11  
**Train the Trainer for Shipping Companies**  
Rome, Italy

20.09.11  
**Air Pollution from Ships (NO<sub>x</sub> & SO<sub>x</sub>)**  
Piraeus, Greece

20. – 21.09.11  
**Designated Person Ashore (DPA) Training Course**  
Madrid, Spain

21.09.11  
**Inspecciones y Certificados**  
Lima, Peru

23.09.11  
**Gas as Ship Fuel**  
Madrid, Spain

27.09.11  
**Oil and Chemical Tankers – Technical and Operational Aspects**  
Istanbul, Turkey

27.09.11  
**EEDI in Practice – Energy Efficiency Design Index**  
Copenhagen, Denmark

28.09.11  
**Crew Safety**  
Limassol, Cyprus

29.09.11  
**Metodologia FMEA Instrumento no Controle de Eventos de Risco na Área da Saúde**  
São Paulo, Brazil

## OCTOBER

02.10.11  
**Port State Control**  
Dubai, UAE

04.10.11  
**Ballast Water Management**  
Singapore

04. – 05.10.11  
**TMSA Workshop – Risk Assessment, Change Management, Incident Investigation**  
Piraeus, Greece

04.10.11  
**ISM para personal de Gestión del Buque**  
Lima, Peru

05. – 06.10.11  
**Persona Designada en Tierra (DPA)**  
Lima, Peru

06.10.11  
**Systematische labor-technische Schadensanalyse maschinen- und anlagentechnischer Komponenten**  
Hamburg, Germany

10. – 12.10.11  
**Energiemanagementsysteme EN 16001/ISO 50001 Intensivkurs für Energiemanager und -Auditoren**  
Hamburg, Germany

11. – 12.10.11  
**Dry Docking – Planning and Preparation for Superintendents**  
Limassol, Cyprus

11.10.11  
**Ship Recycling for Ship Owners**  
Piraeus, Greece

11. – 13.10.11  
**OH&S Management Systems Auditor Con-vention Training Course**  
Dubai, UAE

18. – 20.10.11  
**Port Facility Security Officer (PFSO) Training Course**  
Piraeus, Greece

21.10.11  
**Offshore Basics and Dynamic Positioning**  
Singapore

25.10.11  
**Air Pollution from Ships in Practice**  
Istanbul, Turkey

26. – 28.10.11  
**Representante da Direção Avançado ISO 14001:2004**  
São Paulo, Brazil

31.10.11  
**Gas as Ship Fuel**  
Busan, Republic of Korea

## NOVEMBER

03. – 04.11.11  
**Internal Auditor ISM/ISO 9001:2008 for Shipping Companies**  
Genoa, Italy

04.11.11  
**MASP – Método de Análise e Solução de Problemas – ISO 9001:2008**  
São Paulo, Brazil

08.11.11  
**The IMO Convention on Ship Recycling**  
Hamburg, Germany

09.11.11  
**STCW 2010 Implementation Workshop**  
Genoa, Italy

13. – 17.11.11  
**Superintendent Training Course**  
Dubai, UAE

14. – 17.11.11  
**Approved HazMat Expert**  
Houston, USA

15. – 16.11.11  
**IAMSAR – On-Scene Coordinator Training**  
Copenhagen, Denmark

15.11.11  
**The SOLAS Convention**  
Piraeus, Greece

28.11.11  
**Low Sulphur Fuel – Basics & Experience**  
Hamburg, Germany

30.11.11  
**Flag State Regulations**  
Limassol, Cyprus

30.11. – 01.12.11  
**Vetting Inspections**  
Piraeus, Greece

# Head Start on Going Green

Significant changes to the GL Environmental Passport mean that shipowners can be confident that their vessels remain ahead of the pack in meeting MARPOL requirements

The process of protecting the environment is one of continual improvement. There is always more that can be done to reduce the environmental impact from industry. Regulations do not stand still and forward-thinking shipowners and managers are increasingly looking for ways to demonstrate their commitment to environmental responsibility.

GL's Environmental Passport (EP) has become recognised as a useful mechanism for operators to signal the advanced environmental features of their vessels, which are emerging as a key factor in maintaining competitive fitness in an increasingly crowded market.

## New Guidelines

The Environmental Passport is a voluntary class notation and certification for ships. All mandatory and voluntary environmental features of a vessel are compiled in a single, ready-to-use document including the Environmental Passport certificate, flag state certificates,



compliance certificates, and NO<sub>x</sub> emission diagrams.

The Environmental Passport has been one of the most successful voluntary class notations ever undertaken by GL. As of the beginning of 2011, nearly 10 per cent of GL's fleet in service had opted for the class notation.

The following new requirements have been introduced for the 2011 edition of the EP, which came into force on 1 August 2011:

- Discharge of bilge water is only permitted if the oil content is below 5 ppm. Vessels are also required to have an onboard monitoring and stopping device.
- The vessel must have an approved ballast water treatment system installed.
- The attained Energy Efficiency Design Index (EEDI) value must be calculated and certified\* by GL.
- An Inventory of Hazardous Material (IHM) must be prepared and certified\* by GL.

Also from 1 August 2011, the EP order date will now determine which edition of the EP will apply, not, as in previous editions, the date of the building contract. The new Guideline for the Environmental Service System 2011 (VI-12-1) is available on the GL homepage. ■ SA

## EEDI

In July 2011, at their 62nd session, the Marine Environment Protection Committee (MEPC) of the International Maritime Organization (IMO) announced amendments to MARPOL Annex VI which will make the Energy Efficiency Design Index (EEDI) mandatory. These changes will enter into force on 1 January 2013 for vessels flying the flags of MARPOL Annex VI members.

MORE INFORMATION ABOUT THE EEDI IS PROVIDED IN THIS ISSUE'S EXTRA STARTING ON PAGE 63.

Photo: Dreamstime/Timurd

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\* Statement of Compliance

nonstop



**EFFICIENCY.**

GL helps companies to cut both costs and CO<sub>2</sub> emissions.

Photo: iStockphoto/99\_RoNaiLuo

# Energy Management Pays Off

Industrial companies could lower their energy costs by up to 30 per cent by introducing an energy management system. GL is a reliable partner

According to studies conducted by Fraunhofer, Europe's largest applied sciences research organisation, and other research institutes, businesses could save substantial amounts of money by implementing specific optimisation and modernisation measures in terms of energy use and eliminating energy waste throughout their sites. A recent study concludes that the energy savings potential for German companies is as much as 30 per cent of current energy costs.

One-third of that could be reclaimed directly by implementing specific measures, such as running machines at optimal load, ensuring optimal machine calibration, running machines up to speed precisely at the time they are needed and switching off lights and equipment whenever they are not needed. The remaining savings potential can be realised by replacing outdated, inefficient machinery based on specific energy analyses.

## Energy Efficiency Builds Competitive Advantage

With the expected rise of energy costs over the coming years due to the realisation of worldwide climate goals and growing worldwide demand for energy, energy management is moving into focus as an effective means not only of cutting energy costs but also of helping to achieve CO<sub>2</sub> reduction targets. A certified energy management system ensures that the steps a company takes to improve its energy balance are structured, systematic, effective and consistent with estab-

lished standards, such as ISO 50001 or EN 16001. In addition, it helps enterprises prepare for new regulations requiring the introduction of certified energy management systems. It also demonstrates the company's commitment to energy efficiency and to reducing emissions, improving brand perception and consumer approval. And finally, it enables companies to benefit from government subsidies granted to energy-efficient businesses.

## GL Certification Now Available

Recently, GL announced a new service offering: companies can have their energy management systems certified to the ISO 50001 or EN 16001 standard by GL Systems Certification, the accredited management systems certification unit of GL. GL can either certify an individual energy management system or provide combined certification for several integrated management systems (e.g. integrated environmental and energy management systems according to ISO 14001 and ISO 50001), saving the client both time and money. Specific energy management training courses and seminars are planned to be provided by the GL Academy. ■ AM

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*Complete advance financing is no longer conceivable.*

**DR STEFAN OTTO**  
Deutsche Schiffsbank



*The Chinese banks will be more visible in ship financing.*

**FLORIAN MAACK**  
Nordcapital Emissionshaus



*Today, the equity capital must be brought to the table first.*

**SÖNKE FANSLow**  
Hansa Treuhand

## Finance in Troubled Waters

Ship funds were much in favour with investors – until the financial crisis began. Now the banks are holding back and initiators are pondering the alternatives for raising capital

In the Middle Ages, merchants paid for their ships in gold. Transporting wool, wax or wine over the ocean was fraught with many risks; to minimise their exposure, a shipowner would hold an interest in several ships, and a merchant would charter several vessels. In addition, merchants and shipowners would form partnerships, with full participation in the profits or losses, for the duration of a voyage. Nowadays, the paper dollar dominates the maritime business, but companies are still formed specifically for the financing and operating of ships. Since the 1970s, such companies

have also been available to a broad base of investors: these are the closed-end ship funds in the legal form of a Kommanditgesellschaft (KG), a special German entity with the nature of a limited partnership.

Since 1995, initiators have raised more than a billion euros annually with ship funds, and from 2003 this volume was hiked up to more than two billion euros per year. These figures were determined in a market analysis of participation schemes conducted by Feri EuroRating Services. Driven by the desire to participate in the boom of seaborne trade and pay





*As regards new projects, banks have become extremely cautious.*

**MICHAEL F. SEIDEL**  
Lloyd Fonds

*Many market players are thinking about alternatives.*

**MAX JOHNS**  
German Shippers' Association (VDR)



minimal taxes on the proceeds of their funds, investors packed more and more money into the increasingly expensive cargo ships and tankers. In 2007, at the height of the boom, they invested as much as 3.58 billion euros in ship funds.

### **Collapse of the Markets**

With the implosion of the US investment bank Lehman Brothers in September 2008, the global credit and shipping markets collapsed as well. Many investors are beset by uncertainty. According to the German association for closed-end funds (VGF), only 996 million euros of equity capital streamed into ship funds in 2010, among 286 million euros of rescue capital for ailing fund ships. Even for 2011, Feri EuroRating Services does not see any significant improvement ahead for funds. Since the onset of the crisis, ship finance banks have granted needy ships a respite in repayment, and are accordingly tight-fisted with new projects.

Before the crisis, the banks shouldered a twofold risk for ship financing schemes: they stumped up 60 to 70 per cent of the outside capital, sometimes as much as 80 per cent, and also granted bridging loans for the 20 to 40 per cent of equity capital. But those carefree times are over. "Within the scope of the KG model, complete advance financing by

the banks is simply no longer conceivable for us. This specifically includes the interim financing of equity capital," says Dr Stefan Otto, Chairman of the Board at Deutsche Schiffsbank AG. This is also the view of Sönke Fanslow, Managing Director of Hansa Treuhand: "Today, the equity capital for a financing plan must be brought to the table first. A shipowner or initiator must pay the first construction instalments to the yard himself. Before the crisis, the bank would have picked up the tab."

Michael F. Seidel, CFO of Lloyd Fonds AG, regards a debt ratio of 60 per cent for new projects as practically out of the question: "Banks have become extremely cautious. A few German institutes are slowly beginning to finance projects with a long maturity period and good charter, provided that 50 per cent of the equity capital is paid up front." Commerzbank and its subsidiary, Deutsche Schiffsbank, are becoming more active, with HypoVereinsbank and Nord/LB offering the first issues, but others are still standing on the sidelines.

### **Foreign Ship Financiers Steaming ahead**

Banks from China and Korea are attempting to fill the gap. Financial institutes from the USA and Switzerland are also sensing fresh opportunities. Florian Maack, Managing Director of Nordcapital Emissionshaus, says: "Over the next five years, the Chinese banks will – thanks to their financial muscle – be much more visible in ship financing than is ▶

**CLASSIC.** In the legal form of a KG, the Hamburg based issuer Nordcapital realised the financing of the 5,762 TEU container vessel "E. R. Shanghai", steaming for charterer OOCL.

Photos: Deutsche Schiffsbank, Hansa Treuhand, Lloyd Fonds, NORDCAPITAL/Wunderlich, VDR



► already the case.” At present, they are making sure that loans have a Chinese connection – for example, with the ships being built at a Chinese shipyard.

Many market actors are wondering as to how foreign banks positioned themselves to weather a crisis. Only time will tell. For instance, the Oltmann Group in Leer prefers to team up with their longstanding partners, i.e. regional banks, although they would be prepared to work with foreign institutes, says fund manager Hendrik Jordan. “On the whole, German banks displayed a very positive approach in handling the crisis; we don’t know how things would go with financial institutes from abroad.” Lloyd Fonds, too, prefers German lenders, but would be happy to accept an Asian bank as a minor partner in the consortium. As an alternative, the initiator could work with a financing plan from Asia, given “reasonable conditions”. But this is still all in the realm of theory. Says CFO F. Michael Seidel: “The shipping crisis only went better than expected because the German shipowners, initiators and banks all stuck together.”

### Competition ahead for Ship Funds

Even though the situation is difficult, the industry still believes in the future of ship funds, albeit without the old boom. “Ship funds will continue to exist, but to a much lesser extent than before. As a result, the share held by the domestic ship financing sector of the total volume worldwide will be smaller than was previously the case,” predicts Deutsche Schiffsbank’s Chairman, Dr Stefan Otto. Ship funds will then compete more strongly with the financing offered in the capital market, and also with joint ventures between private equity investors and shipping companies.

Max Johns of the German Shipowners’ Association (VDR) believes that closed-end funds effectively remain the most attractive option for ship financing in Germany: “The KG limited partnership brings investors the benefits of the tonnage tax. Of course, many market players are thinking about alternatives, such as shipping stock corporations, but we do not expect any systemic change here.” Two stock corporations have already existed since 2006 and 2007, namely Marenave Schiffahrts AG by the issuing house König & Cie. and HCI Hammonia Shipping AG by HCI Capital AG and Hammonia Reederei. Are more to follow? CFO Seidel of Lloyd Fonds says: “We are examining all the financing models that could work with ship investments. One possibility would be a stock corporation specialised in shipping that, for example, also issues bonds.” But that is still far off on the horizon. ■ CA

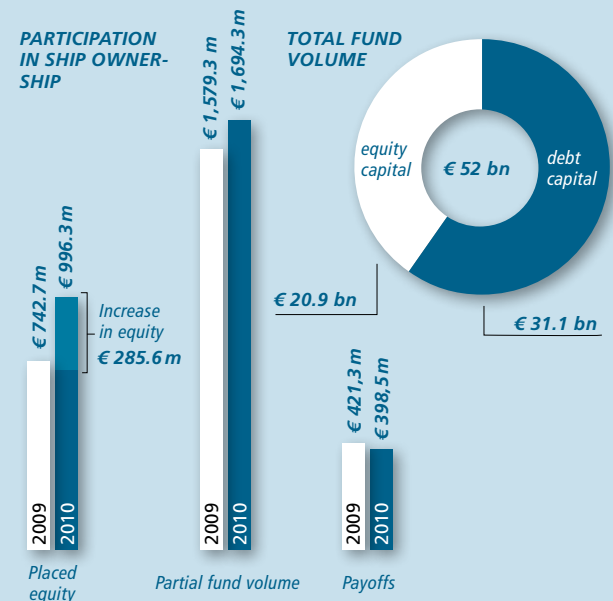
#### BACKGROUND

## Taxation: Historical Perspective

The first ship funds were tax deferral models with start-up losses initially amounting to more than 300 per cent. They were targeted at private investors who could set these losses off against income from other sources and hence reduce their tax burden. With the introduction of the tonnage tax in 1999, ship funds were designed to be so-called “combi-models”, which combined the initial loss allocations with the flat tonnage tax calculated on the basis of the net cargo hold size. The profit determined for a ship according to the tonnage tax method is usually much lower than the actual accounting profit, so that investors pay minimal taxes.

But this favourable tax scenario was constricted step by step: at the end of 2005, Section 15b of the German Income Tax Law terminated the era of the tax deferral model, and combi-models were banned in 2007. Funds now have to make a choice lasting ten years – for tonnage tax or for full taxation of profits after the start-up losses. With that, ship participation became a disbursement-oriented investment.

## Germany’s Ship Fund Market



Source: VGF

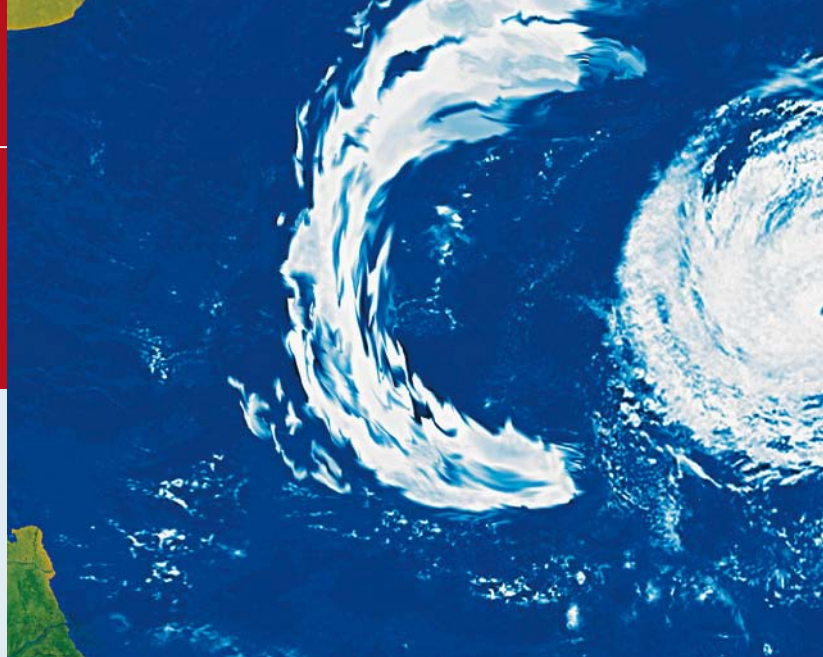




# Outlook on CO<sub>2</sub> Emissions of the Worldwide Container- ship Fleet and Possible Reduction Targets



By Martin Köpke  
and Pierre C. Sames,  
Germanischer Lloyd SE



## Introduction

Climate change caused by greenhouse gas (GHG) emissions is considered as one of the biggest challenges of our time. To avoid severe consequences, the CO<sub>2</sub> concentration needs to be stabilised at about 450 ppm to limit average global warming to 2 °C. The current level of CO<sub>2</sub> is approximately 390 ppm, rising 2 ppm each year. The Stern Review [1] commissioned by the UK Treasury concludes, “There is still time to avoid the worst impacts of climate change, if we take strong action now.” The review adds that the consequences of such an increase in global average surface temperature will still be manageable, though with strong regional variations. The fourth systematic assessment of worldwide scientific publications on climate change by the Intergovernmental Panel on Climate Change (IPCC) documents this challenge [2].

In 2003, the UNFCCC asked the IMO to initiate developments related to the reduction of GHGs from ships, and the assembly of the IMO adopted this in a resolution [3]. Early work resulted in the Operational CO<sub>2</sub> Index [4], now renamed Energy Efficiency Operational Indicator (EEOI), and updated guidelines are available [5]. The operational indicator is a voluntary tool to monitor operational transport efficiency of a ship. It can be used to complement environmental management systems such as the Ship Energy Efficiency Management Plan (SEEMP) [6], adopted by the IMO in July 2011. Discussions at the MEPC also addressed market-based instruments (emission trading system, compensation fund with bunker surcharge and vessel efficiency rating). However, due to the ongoing debate on the IMO’s mandate to regulate CO<sub>2</sub> emissions from shipping, which is being questioned by many countries who have not signed Annex I of the Kyoto Protocol,

no progress has been achieved as yet. Any decision by the IMO may face opposition, in turn delaying UNFCCC decisions on possible CO<sub>2</sub> reductions. Therefore the IMO debate has been focusing on the Energy Efficiency Design Index (EEDI) which was adopted by MEPC 62 as a mandatory newbuilding standard and will enter into force on 1. January 2013 [7].

The United Nations Framework Convention on Climate Change, Conference of Parties No. 16 (UNFCCC COP 16) was held in Cancun in December 2010. While no legally binding document was agreed on, some progress was recorded, in particular towards mitigating the financial burden for developing countries. Again shipping was identified as one possible source, but no commitments were made. Prior to COP 15, the EU had agreed on a proposal for an emission target for shipping tantamount to a 20 per cent reduction of 2005 emissions by 2020. In the wake of COP 15, however, this proposal is being questioned again by some EU member states. At COP 16 the EU Commission openly announced a plan to introduce a regional emission trading system for shipping in the absence of an international agreement by the end of 2011.

The present study forecasts the CO<sub>2</sub> emissions of the worldwide container fleet. First it examines energy efficiency records from existing container vessels based on the EEDI as well as recent EEOI data. The subsequent projections of future container vessel emissions account for both short-term deliveries and long-term assumptions as well as future energy efficiency improvements and their cost efficiency. Necessary future energy efficiency improvements for container vessels are discussed in the light of a comparison of future emissions with prospective emission targets.





Photo: Dreamsime/Intrepid



## EEDI: Energy Efficiency History of Container Vessels

The recorded energy efficiency of container vessels can be derived from publicly available data, in particular, the IHS Fairplay (IHSF) [8] database, which currently lists 6,760 container vessels. Cancelled ships and errors were excluded from the analysis, leaving 6,440 valid datasets. Imperfect data sets were completed using regression formulae (see Table 1).

Figure 1 shows the development of the container fleet in terms of vessels delivered per year and their average size in dwt. Deliveries peaked in 2008 but average vessel sizes continue to increase. Due to the economic crisis starting in late 2008, demand for container vessels dropped dramatically. However, with the global gross domestic product (GDP) recovering, demand

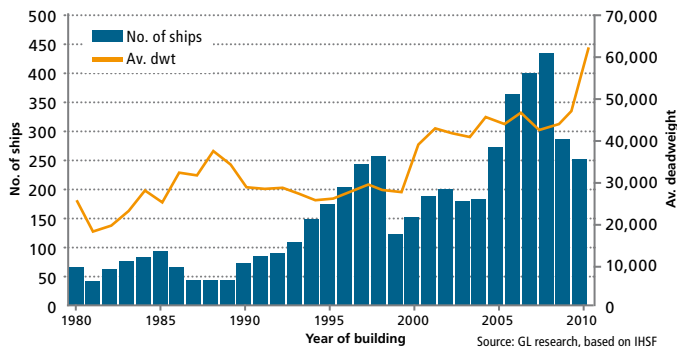
has increased noticeably. In 2010 the container fleet grew by nearly ten per cent, related to deadweight capacity, boosted in part by numerous megaboxer (>10k TEU) deliveries.

For each vessel, the EEDI was computed using the formula from IMO's EEDI reference line documentation [9]. This approach assumes a constant average specific fuel consumption of 190 g/kWh for main engines, and 215 g/kWh for auxiliary engines. Auxiliary power is defined as a percentage of the main engine's power. At the MEPC 60 in July 2009, the assigned dwt for container vessels was lowered to 65 per cent and a new reference line was set [10]. Note that MEPC 62 agreed to change the assigned dwt for container-ships again, to 70 per cent [11]. ▶

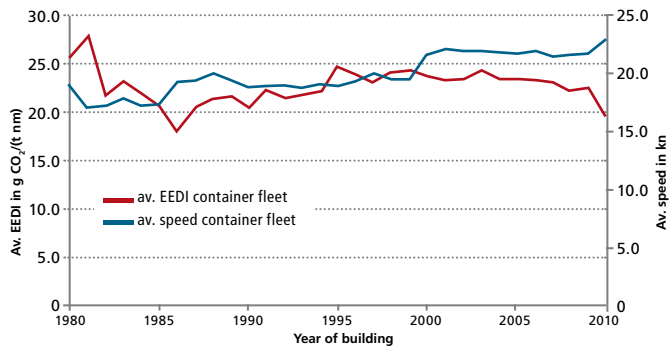
**Table 1: Approximation of Missing Parameters**

Missing parameter	Formula	R <sup>2</sup>
Speed [kn]	$3.0828 \times \text{power}^{0.1935}$	0.90
Power [kW]	$2.0305 \times \text{GT}^{0.8985}$	0.93
TEU	$0.088 \times \text{GT} - 32.696$	0.97
Deadweight [t]	$1.0316 \times \text{GT} + 3603.5$	0.98

**Figure 1: Evolution of container fleet size**



**Figure 2: EEDI and speed evolution of container vessels**





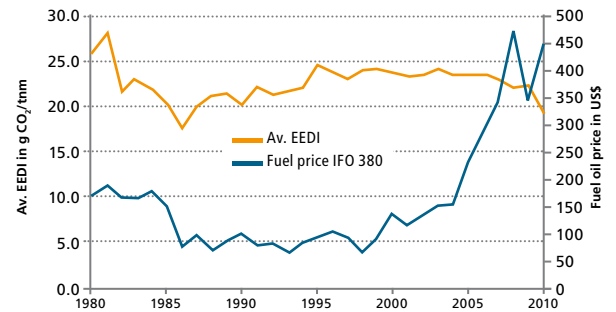
▶ IMO published a new container reference line in its report to MEPC 62, considering 70 per cent deadweight. However, due to time constraints of this study, the reference line acc. to [10] is used in the following. The speed data from the database was used as reference speed, acknowledging that this may not be sufficiently accurate for the EEDI condition (which is 75 per cent maximum continuous rating (MCR) at 65 per cent dwt for container vessels). The computed average EEDI per year, weighted according to the number of vessels in each age group, is presented in Figure 2. It should be noted that the energy efficiency of container vessels has begun improving only recently. The main reason is that technological advances were transformed into higher service speeds which were readily accepted as long as fuel prices were rather low (Fig. 2). The decrease of recorded EEDI from 1981 to 1986 was likely pushed by the growth in average vessel size (Fig. 1).

Thereafter, average vessel sizes decreased and stayed constant for a decade although the number of new vessels increased fivefold. As fuel prices began to increase in 2001, the economic pressure to reduce fuel costs increased. Between 1980 and 1986, the average annual EEDI of a container vessel decreased while fuel prices remained relatively high (Fig. 3). The same trend could be observed during the past four years. However, this time the price increase rate and the EEDI decrease were much more pronounced, presumably because of the high transport demand in recent years and the long project planning times for new ships.

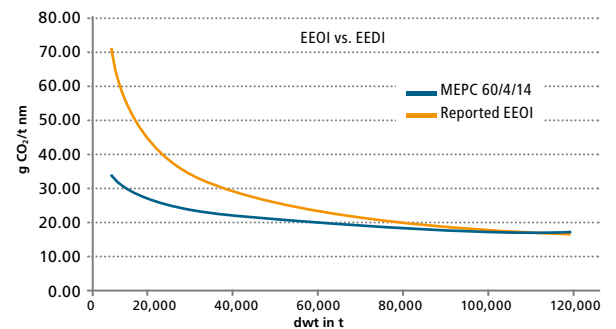
## Recorded Operational Energy Efficiency of Container Vessels

The operational energy efficiency is determined based on actual fuel consumption and actual transport work to reflect the way the vessel is handled and document actual CO<sub>2</sub> emissions. Germanischer Lloyd was the first classification society to implement the EEOI and offer certification to the corresponding IMO Guideline [4]; the same applies to the most recent version [5]. GL clients can monitor their EEOI on a vol-

**Figure 3: Development of annual average fuel prices (HFO IFO 380 in Rotterdam) and annual EEDI of container vessels**



**Figure 4: Trends based on the reported energy efficiency operational indicator for container vessels**



**Figure 5: Transport demand for container vessels (tonne-miles index, 2007=100, from MEPC 59/INF.10)**

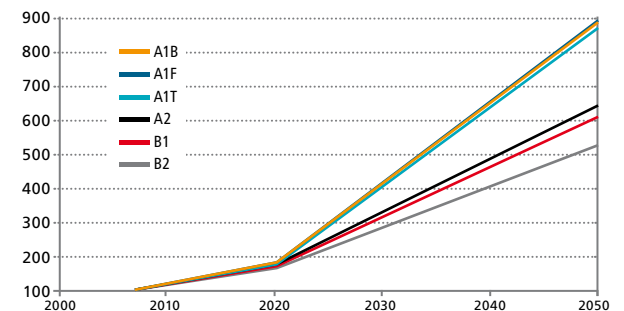






Photo: Dreamstime/De Graaf



untary basis and free of charge via GL's fleet online. The data captured was analysed to document the overall status (without disclosing any individual or ship-specific information). As Figure 4 demonstrates, the trend curve re-reflecting reported EEOI data shows higher values than the EEDI baseline as provided by Denmark et al. [10]. The ratio of EEOI vs. EEDI-baseline decreases from 1.8 for small dwt sizes to about 1 for large dwt. This can be explained by the actual vessel utilisation. The EEDI thus presents a maximum theoretical efficiency whereas the EEOI represents the real achieved efficiency.

## Projection of Future Emissions from Container Shipping

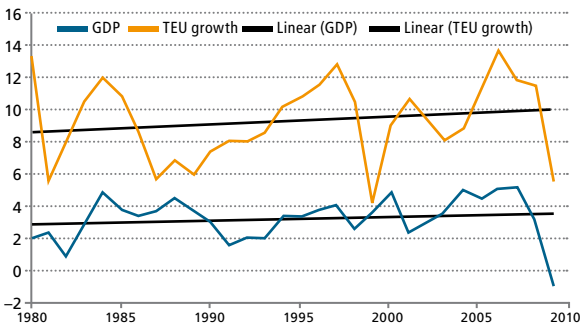
The model chosen for this study is based on TEU capacity, which offers the option of directly referencing container demand models in subsequent studies. This approach is similar to the one of [12]. However, the present study distinguishes seven container vessel sizes rather than six to account for the recent significant increase in container vessel sizes. The current model predicts CO<sub>2</sub> emissions for each calendar year based on total TEU capacity. It comprises up to 30

age groups. Each age group represents the TEU capacity active in a given year. TEU capacity from recycled old tonnage is removed from each year, and newbuild capacity is added. There is a difference between the time span from 2011 to 2015, for which prospective deliveries and removals from service can be predicted fairly accurately, and the subsequent years (2016 to 2050), where assumed net fleet growth rates were used.

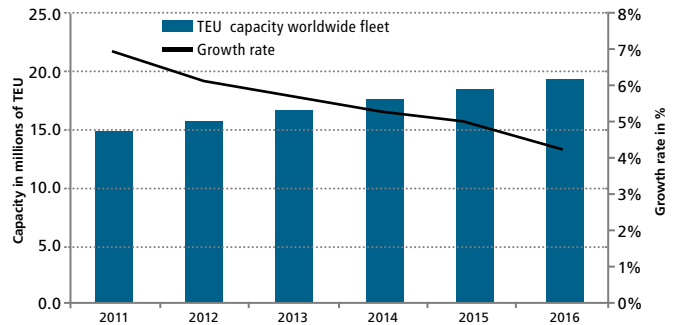
## Assumptions in the Current Prediction Model

The second IMO inventory study [13] with updates by the IMO Secretary in March 2010 [14] provides the most up-to-date and complete overview on ship fuel consumption and CO<sub>2</sub> emissions. It forecasts strong fleet growth, especially for container vessels, where a five per cent annual growth is expected until 2050. For IPCC scenario A1B, considered by the authors of this study as one of the more likely scenarios, this will result in a doubling of the demand for tonne-miles between 2007 and 2020, and a further 4.5-fold increase from 2020 to 2050 (Fig. 5). For the current prediction, the authors of this study ▶

**Figure 6: Growth rates of global GDP and container vessel TEU capacity**



**Figure 7: Container demand growth prediction**





► also analysed data from the IMF and IHSF to examine the interdependency between global GDP growth and the worldwide container fleet TEU capacity growth (Fig. 6). The ratio between both growth rates was nearly constant over the last three decades, with both decreasing slowly over time. For this study, the authors used available short-term predictions from [15] as well as GL research, arriving at the growth rates shown in Figure 7. These allow modelling the container vessel fleet capacity growth rate based on predictions used by [13] IPCC, scenario A1B. In addition, different TEU capacity growth rates were used for different TEU size categories (Table 2). The total TEU capacity of the container vessel fleet and the underlying growth rates were adjusted to match the growth predictions from the second IMO inventory study [13] (Fig. 5 and 8).

This ensures compatibility of the results obtained from different models. However, it should be noted that the IMO's GHG study extrapolates tonne-miles as transport demand, while this study uses TEU capacity, with implicitly assumed constant distances and a constant ratio of transported mass and TEU. The second IMO inventory study [13] additionally documented typical operating days and load factors for main and auxiliary engines which were incorporated into the current model (refer to Table 2). The only exception is that the operating day values for the two largest classes were as-

**Table 2: Assumptions used in the current model**

Size group	Long-term TEU capacity growth rate	Main engine operating days	Auxiliary engine operating days	Main engine load	Auxiliary engine load
11,000+ TEU	8.0%	260	215	67%	60%
8-10,999 TEU	7.0%	260	215	67%	60%
5-7,999 TEU	5.0%	257	229	65%	60%
3-4,999 TEU	4.0%	250	223	65%	60%
2-2,999 TEU	2.0%	251	224	65%	60%
1-1,999 TEU	2.0%	259	231	65%	60%
<1,000 TEU	1.0%	180	161	65%	60%

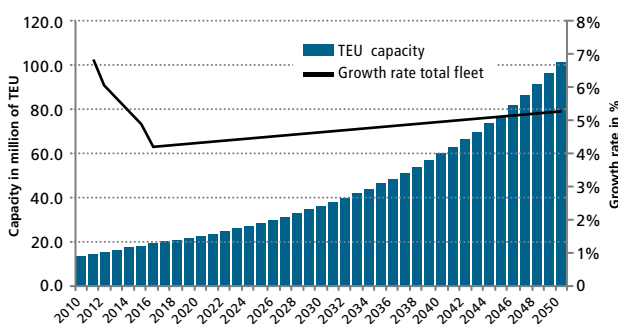
**Table 3: Assumed specific fuel oil consumption of main engines (g/kWh)**

Year	>15,000 kW	5,000 – 15,000 kW	<5,000 kW
1983	205	215	225
1984–2000	185	195	205
2000	175	185	195

**Table 4: Assumed specific fuel oil consumption of auxiliary engines**

Engine age	Above 800 kW	Below 800 kW
any	220 g/kWh	230 g/kWh

**Figure 8: TEU capacity and its growth rate used in the model**



**Figure 9: Specific installed main engine power for container vessels**

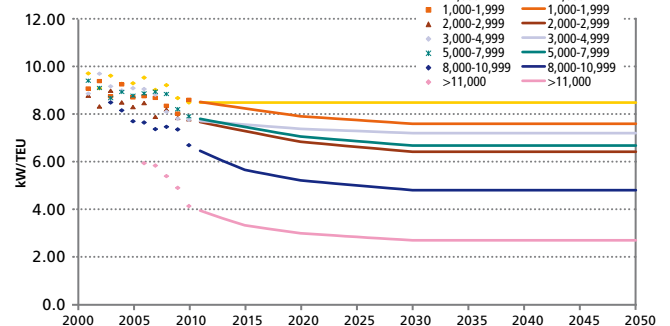






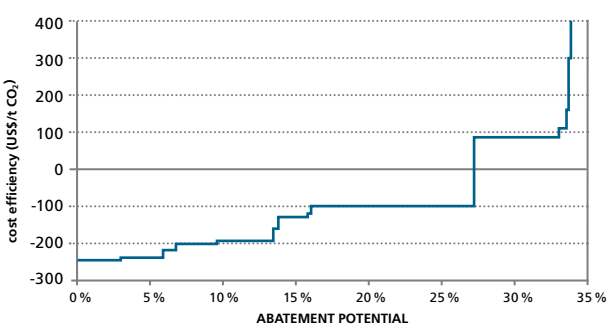
Photo: Hasenpusch



**Table 5: List of CO<sub>2</sub> reduction measures and potentials using 2025 as an example**

Reduction measures	Abatement potential [Mt/a]	Cost efficiency [US\$/t CO <sub>2</sub> ]	
Design optimisation	7.95	1.68%	-511
Propeller cleaning	9.31	1.97%	-508
Trim/draught	4.56	0.96%	-501
Hull openings	4.29	0.91%	-479
Hull coating and maintenance	9.31	1.97%	-468
Performance monitoring	5.48	1.16%	-458
Propulsion improvement devices	12.98	2.74%	-457
Voyage Execution	4.09	0.86%	-422
Speed control of pumps and fans	1.66	0.35%	-421
Hull form optimisation	8.28	1.75%	-392
Weather routing	1.38	0.29%	-353
Air cavity systems	1.26	0.27%	-269
Power reduction	50.73	10.71%	-233
Reefer improvement	0.56	0.12%	-105
Waste heat recovery	2.74	0.58%	-61
Fuel cells	0.00	0.00%	0
Main engine retrofit	1.05	0.22%	31
LNG-fuelled ships	27.83	5.88%	53
Towing kite	0.20	0.04%	179
Air drag reduction	1.34	0.28%	3,481

**Figure 10: MACC for container fleet in 2025**



sumed to be equal. For the specific fuel oil consumption as provided by [12], the study differentiates engine sizes and years built (Tables 3 and 4).

Using IHSF data on delivered vessels, the installed main engine power per nominal TEU was analysed to forecast its future evolution (Fig. 9). Notably, the specific power of small container vessels is predicted not to decrease whereas significant improvement is foreseen in the largest vessels, enabled by a combination of factors such as improved engines and hulls as well as scale effects due to growing vessel sizes. In recent years the energy demand per TEU of the largest vessels has decreased significantly. However, without regulatory pressure this trend will likely slow down and eventually stagnate for technical reasons, which keep ships within the “business” as usual’ scenario (see below).

### Assumptions for Applying CO<sub>2</sub> Emission Reduction Measures to the Prediction Model

The CO<sub>2</sub> emission projections of this study reflect future energy efficiency improvements. The corresponding CO<sub>2</sub> abatement was derived from marginal abatement cost curves (MACC), which plot cost efficiency over the maximal achievable CO<sub>2</sub> abatement (Fig. 10). The MACC approach can support policy decisions regarding the costs of achieving specific reduction targets, or regarding the environmental effects of market-based measures [13]. It can also help ship designers, builders, owners and operators decide on the implementation of new technology and operational changes for future and existing ships [16].

This study uses the MACC to improve the prediction of future CO<sub>2</sub> emissions of the container fleet. The advantage of this approach is that the MACC incorporates variables such as fleet growth and fuel price development (Fig. 11). The developed MACC includes the CO<sub>2</sub> emission reduction potentials of 20 different measures applied to container vessels (Table 5). The study further assumes that cost-efficient and profitable measures are likely to be implemented ▶

► first. In the MACC diagram these measures are shown with negative cost-effectiveness.

## CO<sub>2</sub> Emissions from the Worldwide Container Vessel Fleet

Based on the above data and assumptions, the authors computed the annual CO<sub>2</sub> emissions per ship size group. The oldest vessels were removed from each group and new vessels added to match the TEU growth rates described above. Three scenarios were investigated:

- Business as usual (Fig. 12)
- Implementation of all cost-effective energy efficiency improvements (Fig. 13)
- Implementation of energy efficiency improvements and application of a market-based measure equivalent to a surcharge of about 100 US dollars per tonne of CO<sub>2</sub> (Fig. 14).

Each scenario is compared to a possible reduction target suggested by the European Union to COP 15. It is assumed that both, the regulatory framework and market pressure will encourage energy efficiency improvements. The study differentiates between operational and design-based improve-

ments. Design measures (EEDI style) were only considered for new vessels joining the fleet whereas operational measures (SEEMP style) are applied to the entire fleet.

IMO's EEDI and SEEMP instruments are the first measures to effectively stimulate CO<sub>2</sub> reduction in new designs as well as ships in service. Germanischer Lloyd was the first classification society to implement the EEDI and offer certification to IMO Guidelines MEPC.1Circ.681 [7] and Circ.682 [17]. With the adaption of the EEDI as an amendment of MARPOL Annex VI, the first flag states are giving incentives for ships with lower EEDI values, such as Singapore with its Green Ship Programme, to encourage the market to use energy-efficient ship designs [18].

## Conclusions

Global warming and its consequences are considered to be serious threats to the future well-being of mankind. Uncertainties related to the prediction accuracy of the science of climate change only highlight the necessity to take action. Each sector of the industry will need ambitious CO<sub>2</sub> emission reductions to prevent a further increase of global warming. The IMO is developing measures to eventually

Figure 11: Assumed future fuel price development

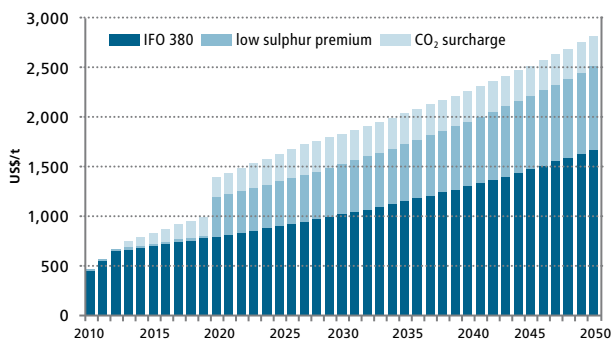
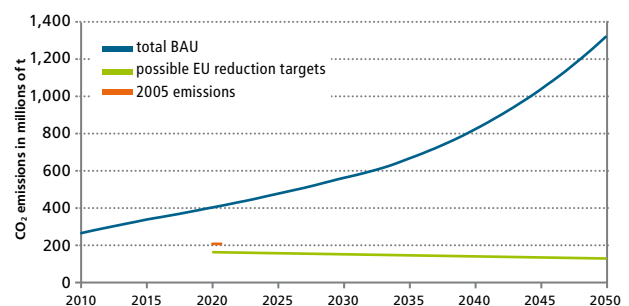


Figure 12: Projected CO<sub>2</sub> emissions from container shipping – BAU scenario







reduce CO<sub>2</sub> emissions from ships. Based on a fleet-wide projection, the study predicts future CO<sub>2</sub> emissions from container ships, comparing them with a prospective emission target that has been derived from the most recent EU proposal to COP 15, without actually having been discussed at the IMO or UNFCCC to date. The study concludes that even after implementing far-reaching energy efficiency improvements in both design and operation, container shipping will probably fail to meet the potential emission target. Even market-based measures will not be sufficient to change this outcome.

As a consequence, the shipping industry may have to purchase emission credits from other sectors (in case an emission trading system is adopted as a market-based measure at IMO). Efficiency improvements should therefore be implemented at the earliest time possible to create the largest possible effect in terms of emission reductions. Furthermore, priority should be given to the development of cleaner, smarter and more energy-efficient vessels leveraging innovative technologies. It seems prudent for a maritime research and technology agenda to focus on the vision of a “zero-emission ship”. Realising the maritime energy-saving and

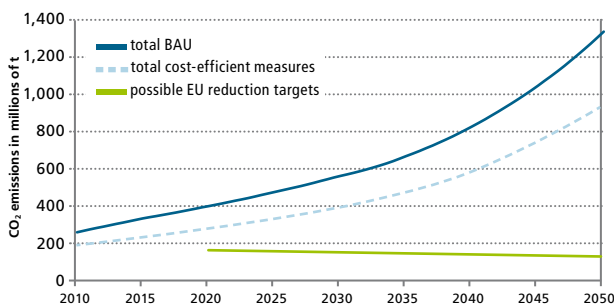
decarbonising potential will help foster competitiveness and stimulate the development of the market for energy-efficient technologies, products and services.

## Acknowledgements & Literature

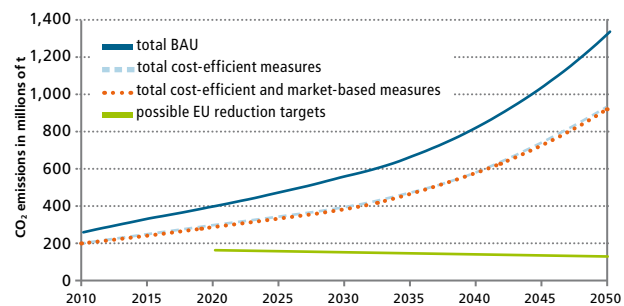
The authors would like to thank Hannes Cordsen and Hauke Glaser for their special support during the production of this paper. The opinions expressed in this study do not necessarily represent the views of GL.

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**Figure 13: Projected CO<sub>2</sub> emissions from container shipping considering cost effective energy efficiency improvements**



**Figure 14: Projected CO<sub>2</sub> emissions from container shipping considering cost effective energy efficiency improvements and market-based measures**



# Zero Emissions –



## IMPLEMENTATION.

GL has developed a holistic concept for a completely emission-free container feeder vessel.



# a Dream?

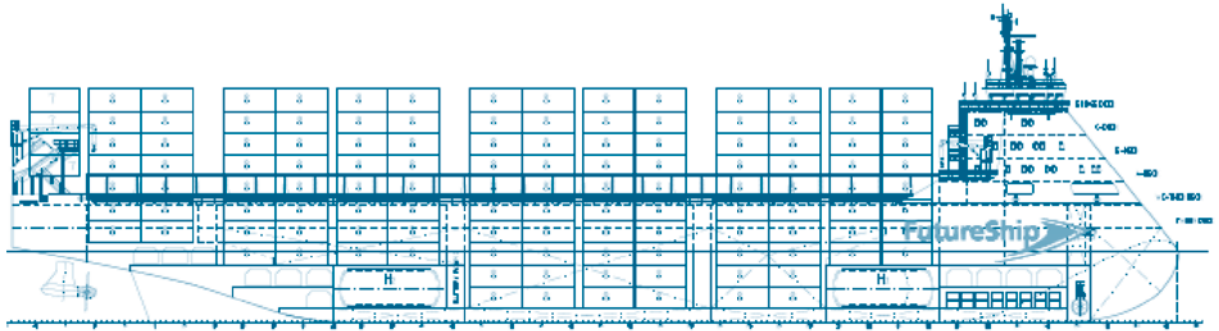
The global fleet keeps growing and, barring unexpected changes in the world's supply chain, it will continue to do so, producing more pollutants and greenhouse gases. No remedy in sight? As a matter of fact, there is...

**T**echnical and operational efficiency improvements may lower CO<sub>2</sub> emissions from ships by as much as 20 per cent across the global fleet. But even that will not stop the steady increase of total emissions from shipping, let alone hit reduction targets, such as those proposed by the EU Commission calling for a 40 per cent reduction of CO<sub>2</sub> output from shipping compared to 2005 levels by the year 2050. The shipping world needs to look into innovative designs and alternatives to traditional fuels to meet these ambitious reduction targets.

## A Vision – and a Concept

A slim blue vessel glides into view, quietly pulling up alongside an offshore platform. In the distance, several large, white wind turbines are gently rotating in the wind. From bunkering stations on the platform, two articulated arms swing down to the vessel, automatically latching onto its refueling ports. A few hours later the vessel departs again, ▶





**SHEER DRAUGHT.** Design draft of an LH<sub>2</sub>-operated 1,000 TEU feeder vessel with two power-generating areas.

**LH<sub>2</sub>.**  
At temperatures below 20.27 kelvin, hydrogen condenses into a clear, colourless liquid. This condition is abbreviated as LH<sub>2</sub> (liquid hydrogen).

► sailing off across the North Sea. A scene from a science fiction movie?

An actual zero-emission vessel – a commercial ship operating entirely without causing any SO<sub>x</sub>, NO<sub>x</sub>, particulate matter or greenhouse gas emissions, whether from its on-board machinery or from the plants producing its fuel – is a vision that sounds too good to be true. But surprisingly, modern technology is entirely capable of building such a ship. In a holistic approach, GL Strategic Research and Development has elaborated a design concept for a zero emission container feeder vessel, a completely emission-free ship powered by liquid hydrogen that would be produced using wind energy. The concept assumes deployment of the vessel in northern European waters on typical ten-day round-trip voyages.

### Design and Principal Features

The design concept envisions a container feeder vessel with a fully open top, 1,000 TEU intake including 150 reefer slots. The open-top design reduces loading and unloading time, allowing the vessel to sail at reduced speeds, whereas a conventional, faster vessel has to spend more time in port. The ship features standard principal dimensions but a reduced design speed of 15 knots to minimise the required propulsion power.

There are two power generation rooms, situated forward and aft, respectively. The vessel uses two podded propulsors for primary propulsion and a “take-me-home” thruster for extra manoeuvrability and drive redundancy.

The vessel would rely on a 5 MW fuel-cell system for propulsion, made up of ten linked 0.5 MW modules. The 920 m<sup>3</sup> of LH<sub>2</sub> fuel stored in multiple pressurised, C-type tanks would be sufficient to power the vessel over a typical 10-day round-trip. Based on GL’s 2009 study for an LNG-fuelled

container feeder vessel, an estimated 6 per cent of the TEU capacity of the vessel would need to be sacrificed for the hydrogen fuel tanks. These are arranged forward and aft to support a dual-bunkering approach and achieve a three-hour refuelling time.

Since fuel cells typically cannot generate peak power rapidly, a 3-MW battery system, charged by the fuel cell system, would store power for peak usage.

### Investment Costs

The investment costs for the LH<sub>2</sub>-fuelled container vessel would be significantly higher than for a similarly-sized conventional ship. Based on data from a GL market study on fuel cell systems as well as the aforementioned LNG feeder vessel study, the cost of the LH<sub>2</sub>-fuelled vessel is estimated at roughly 35 million US dollars, 60 per cent higher than an HFO/MGO-fuelled vessel (million US dollars). The extra cost is caused by the fuel cell system (57 per cent of additional costs), the C-type tanks (37 per cent) and the battery system (six per cent). This estimate assumes a steady decline of the costs of fuel cells and decreased investment costs of about 1500 US\$/kW by 2020.

### Offshore LH<sub>2</sub> Production, Storage and Delivery

For a true “zero”-emission vessel, it is necessary to go beyond the emissions from the ship itself and account for the production of its fuel as well. The GL design concept proposes a bunkering station that uses wind energy to produce LH<sub>2</sub>.

The 2020 target for offshore wind farms operating in the German Exclusive Economic Zone (EEZ) is an installed capacity of approximately 3 GW. One of the disadvantages of existing forms of renewable energy, however, is the intermittent supply. The current grid infrastructure and the



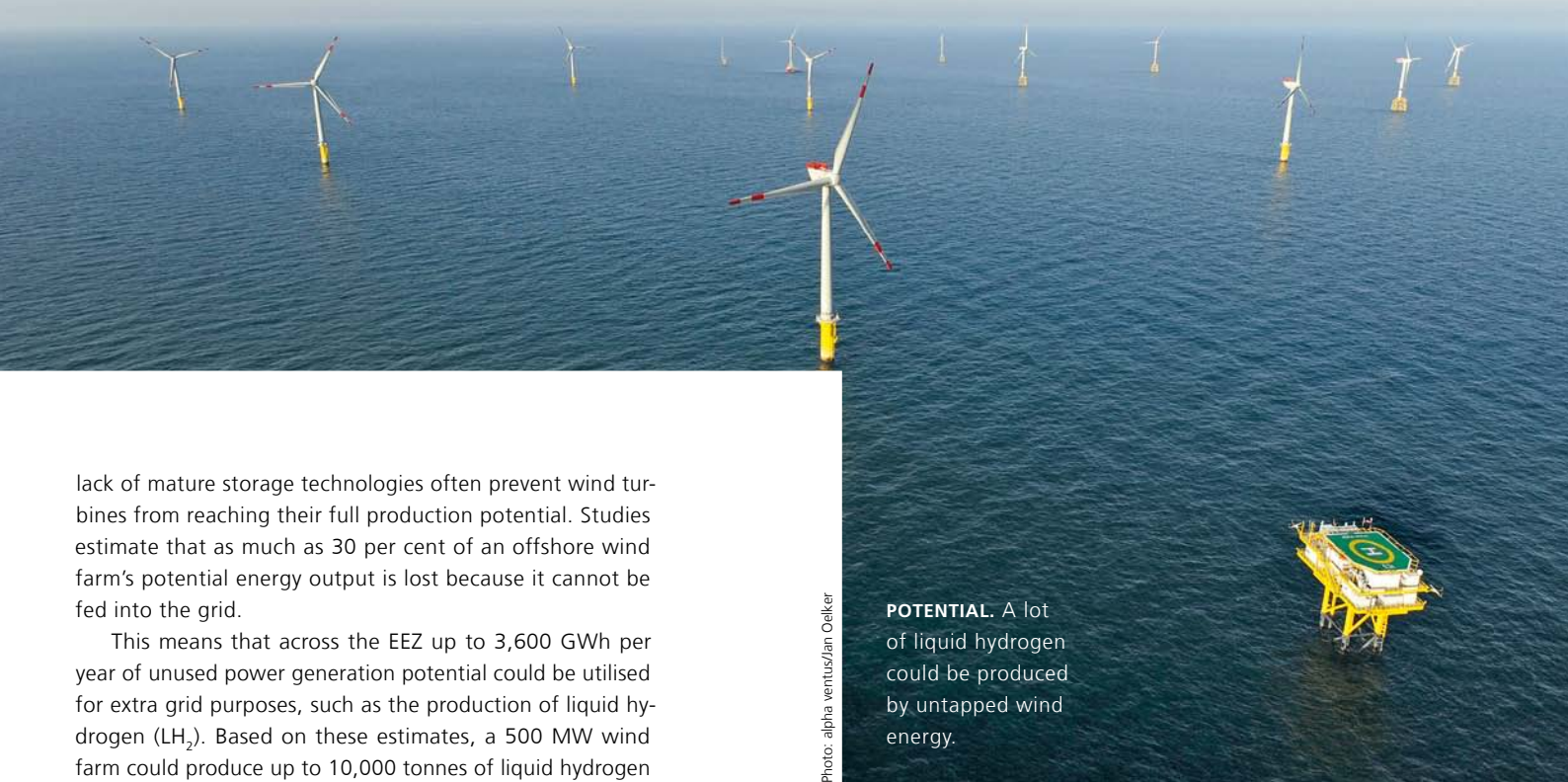


Photo: alpha ventus/Jan Oelker

lack of mature storage technologies often prevent wind turbines from reaching their full production potential. Studies estimate that as much as 30 per cent of an offshore wind farm's potential energy output is lost because it cannot be fed into the grid.

This means that across the EEZ up to 3,600 GWh per year of unused power generation potential could be utilised for extra grid purposes, such as the production of liquid hydrogen (LH<sub>2</sub>). Based on these estimates, a 500 MW wind farm could produce up to 10,000 tonnes of liquid hydrogen using this surplus power to serve the bunkering needs of up to five feeder vessels of the size described above.

The hydrogen produced could be liquefied and stored in tanks. Intermediate storage of LH<sub>2</sub> for up to ten days would require installation of insulated tanks of up to 5,000 m<sup>3</sup>. With the wind farm operating approximately 4,000 hours per annum, the price of LH<sub>2</sub> would be about US\$7,500/t. These costs include production, liquefaction and on-site storage.

### Competitive with MGO in 2025

GL estimates that liquid hydrogen produced by wind power could be commercially attractive sometime between 2020 and 2030, provided that the price of MGO increases to US\$2000/t (see info box on the right). Background: During the decade from 2000 until 2010, prices increased from US\$250 to US\$650/t, with an intermittent peak value of US\$1319/t in June 2008.

The pressure to reduce greenhouse gases will continue to grow over the coming years, and the pivotal year 2020 is within the lifetime of many vessels currently operating. The CO<sub>2</sub> reduction goals will not be reached unless new technology is embraced. The vision of a zero-emission vessel as outlined above demonstrates that new technology can pave the way towards meeting ambitious targets and can indeed propel the industry into the future. ■ PS/SA

#### FOR FURTHER INFORMATION:

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 Phone: +49 40 36149-113, E-Mail: pierre.sames@gl-group.com

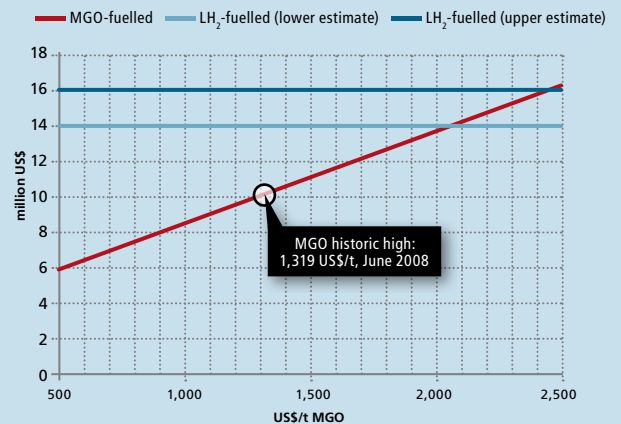
**POTENTIAL.** A lot of liquid hydrogen could be produced by untapped wind energy.

#### COMPARISON OF COSTS

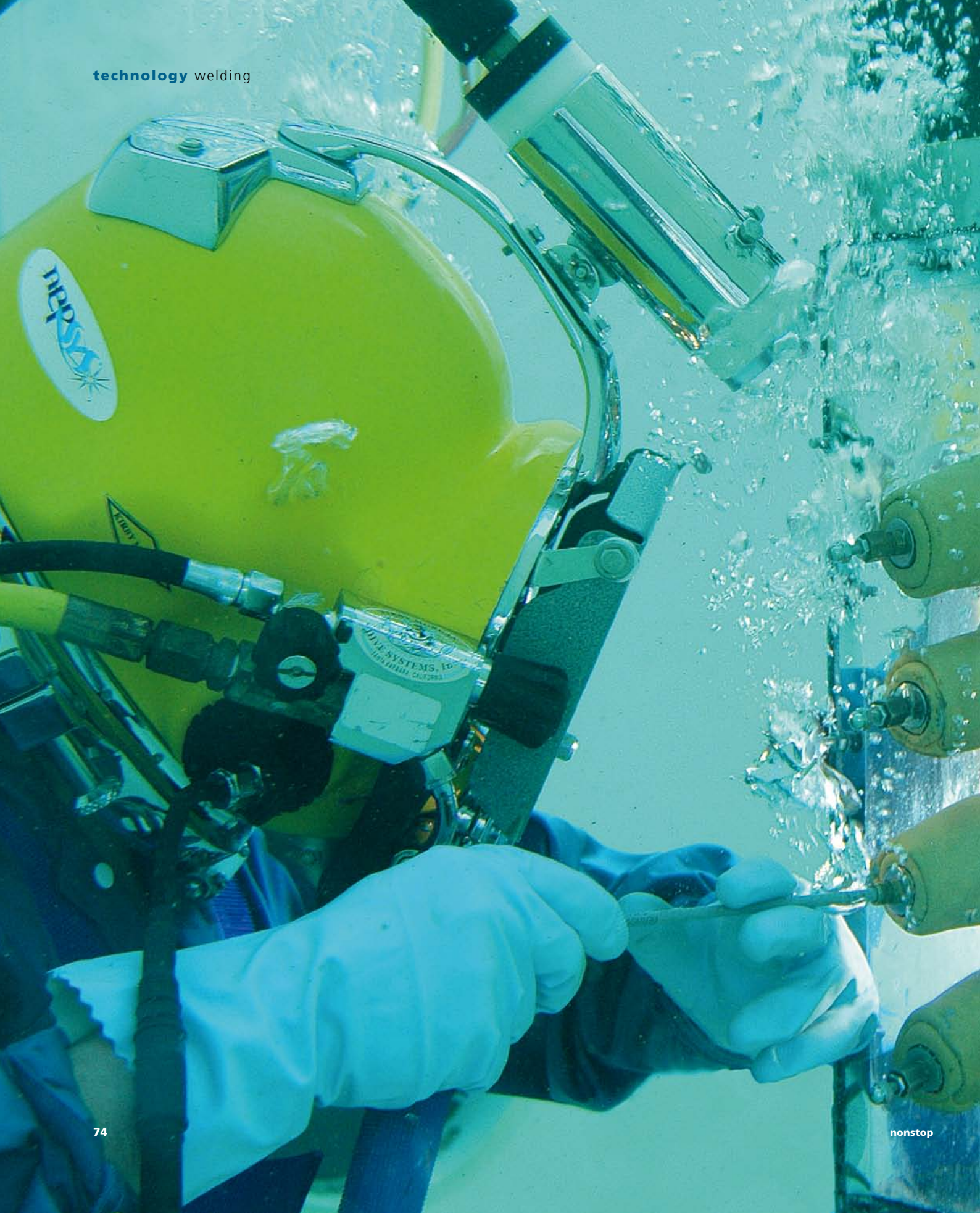
## Economic Alternative

For this estimate, the annual costs for an LH<sub>2</sub>-fuelled feeder ship, including fuel costs, other operating costs and annualised capital costs, were compared with those of a conventional, MGO-powered feeder vessel operating inside of an ECA. The difference between current MGO prices and the expected price level that would make LH<sub>2</sub> commercially attractive was evaluated based on the development of MGO prices from 2000 until 2010.

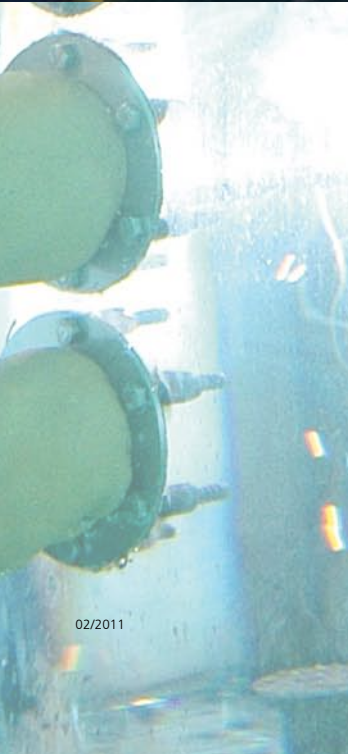
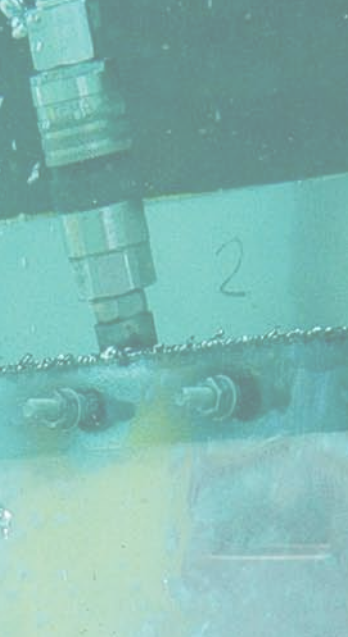
### Annual costs for container feeder vessels











Photos: Neptune Marine Services, alpha ventus

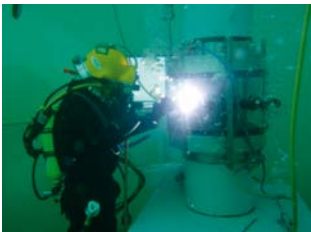
# Dry Welding in the Wet

Offshore energy, both conventional and renewable, is in great demand, and new offshore structures are being built at a breathtaking pace. Their steel elements, exposed to a hostile environment, must be carefully maintained to avoid premature failure. A look at the fascinating Nepsys welding technique

Increasing numbers of offshore assets require repair, maintenance work and modification. For steel structures immersed in water, from oil platforms and wind turbines to ships, that often means underwater welding. Considering the stringent requirements these structures must meet, it is easy to imagine how difficult it must be to create welded joints that stand the test: the molten consumable must fuse inseparably with the material of the structure. In addition, the welding work should not affect ongoing operations on the structure, and it must be safe and cost-efficient. Conventional underwater welding techniques cannot easily meet these requirements.

How can you achieve underwater welding results equivalent to dry-welding standards without taking the ▶

**CUSTOM MADE.**  
A welder accesses the welding habitat with the electrode using "welding socks".



**NEPSYS.** The technology allows the diver to perform a dry weld in an underwater environment.

► structure out of the water? Neptune Marine Services of Perth, Australia, knows the answer: "Instead of taking damaged areas to a dry environment, we take a dry environment to the damage, wherever it is located," explains Nino Amato, Group Welding Manager at Neptune. The company introduced a patented technology called Nepsys that is capable of producing consistently high weld quality below the waterline while being both cost-efficient and safe.

### Quenching Prohibited

Neptune establishes a customised "welding habitat" around the underwater area to be welded. This protective zone is secured in place using adjustable seals, suction cups, magnets or straps. The result is a fully enclosed, controlled environment isolating the welding zone from its aqueous surrounding. Continuous delivery of argon gas to the habitat purges out the water and creates a hydrogen-free environment to prevent quenching and ensure even heat distribution. „Quenching is one of the main critical factors for underwater welding," explains Nino Amato. "Welds can become porous due to rapid quenching when working directly in the water. With Nepsys, we have no quenching effects because the weld cools down more slowly." With Nepsys the company consistently achieves class A quality welds compli-

### GL OFFERING:

#### **Workshop approvals according to:**

GL Rules, EN ISO 3834-2 to -4, DIN 2303, DIN 18800-7, EN 1090-1, EN 15085-2, EN 17660, AD 2000 HP 0

#### **Welders and operators qualification according to:**

DIN EN 287, EN ISO 9606, EN 1418, ISO 14732, AWS D1.1, AWS D3.6M, AD 2000 HP 3, EN ISO 14555, EN ISO 15618-1 and -2, ASME Sec. IX, EN 13133 (brazer)

#### **Welding procedure tests according to:**

GL Rules for Welding, EN ISO 15614-1 to -13, EN ISO 14555 (stud welding), EN 13134 (brazing), AD 2000 HP 2/1

#### **Approval of NDT workshops**

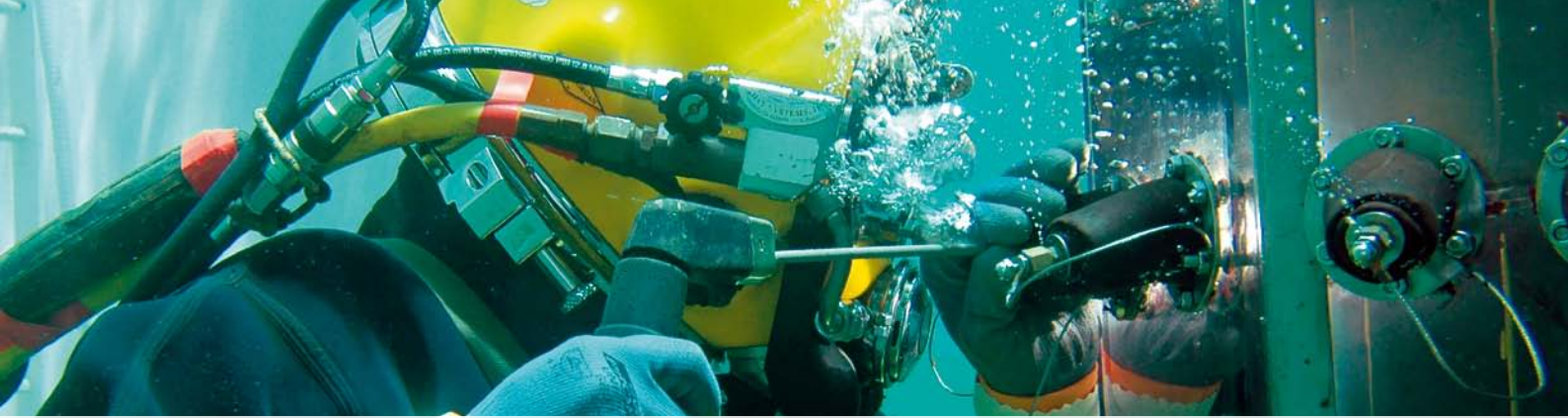
ant with all applicable codes such as AWS D3.6 Class A and ISO 15614-10.

Qualified Nepsys welders wear standard commercial diving equipment. They communicate by intercom with their supervisor above the surface who monitors and adjusts the welding temperature and gas pressure on a control panel. Welders use pre-defined communication codes such as "go hot" or "go cool" to tell their partner to switch the arc on or off. To access the welding habitat with the proprietary electrode the welder uses a so-called "welding sock". The electrodes are similar to those used onshore but are coated with a special wax for water protection.

Contrary to other underwater dry welding concepts, the Nepsys welders remain outside the dry environment of the habitat. In case of an emergency, the welder gets away from the working surface quickly and safely. "Safety is a big issue in underwater welding," Nino Amato points out. "The diver has to cope with a huge amount of welding cables, poor visibility, rough sea conditions and limited communication possibilities. It is essential that the welder is not covered by a habitat that would limit his mobility."

"Nepsys offers an alternative to existing methods such as wet and Hypobaric welding," explains Nino Amato. "Whilst Hypobaric welding has longer offshore production times that





#### COMPANY PROFILE

## About Neptune Marine Services

Neptune Marine Services is a provider of engineering solutions to the oil and gas, marine and renewable energy industries and is headquartered in Perth, Western Australia. The Com-

pany offers dry underwater welding solutions; subsea and pipeline engineering; offshore asset integrity management; ROV services; hydrographic surveying, positioning and

geophysical services; commercial diving; specialist fabrication; pipeline stabilisation and grouting; rope access and platform IRM; and end-to-end project management.

incur greater costs than Nepsys, wet welding has weldability issues as a permanent welded solution." It has been proven that the company's technology achieves class A welded joints that is equal or better than welding performed in dry workshop conditions.

### Quality Standards

GL's welding experts are intimately familiar with the intricacies of welding technology. What is complex ashore becomes even more challenging under water. While the result of welding is visible immediately, the quality of a weld is not so obvious. "This is why it is so crucial to know exactly what you are doing," stresses GL welding specialist Marcus von Busch. GL has issued procedural guidelines within the scope of its technical rules to establish welding quality standards. These guidelines explain how to avoid mistakes and flaws in welding.

Neptune's dry underwater welding technology has been tested and certified by Germanischer Lloyd. This allows the company to carry out certain types of underwater welding work using Nepsys on GL-classed ships. The GL certification confirms that the Australian company has adequate equipment, qualified welding supervisors and welders certified for the required processes.

According to the GL procedural rules, prior to starting a new job Neptune must clarify the following questions: What kinds of materials are we going to weld, what kind of equipment and filler material will we need, and what is the best method of joining the pieces? Before beginning the actual assembly process, the selected combination is tested. This welding procedure test, which is monitored and certified by technical experts from GL, scrutinises the processes to be applied by Neptune.

In the welding procedure test, Germanischer Lloyd examines whether the existing welding instructions are sufficient to enable the Neptune welders to produce high-quality welds. During the test, a sample is welded up in the presence of a GL surveyor. The sample is then expedited to a GL-approved, accredited laboratory for non-destructive and destructive testing. These tests deliver solid data on the quality of the workmanship. This procedure intends to identify a welding technique that will minimise negative effects on material properties. ■ MD

#### FOR FURTHER INFORMATION:

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# The Race for Stronger Boats

In response to a growing number of structural failures, the International Sailing Federation (ISAF) has launched a major new safety initiative, publishing details of its new Offshore Special Regulations Structural Plan Review

**T**he Structural Plan Review aims to combat an increase in the number of structural failures in offshore yachts and the safety concerns associated with such failures. The ISAF Offshore Special Regulations (OSR) have been amended to strengthen the requirements for hull construction. The objective of the Structural Plan Review is to enforce compliance with these new requirements as soon as possible.

Jason Smithwick, Head of the ISAF Technical and Offshore Department, explains: "ISAF has sent out a clear message that safety at sea is paramount and structural problems which can result in keel and hull failures must be addressed. The Structural Plan Review provides a clear framework for designers, builders and owners to ensure they comply with the recent updates to the Offshore Special Regulations. As part of the scheme we have published a series of documents

which give a simple guide to the Structural Plan Review and the steps which need to be taken by different parties."

## Notified Body

Germanischer Lloyd was accredited as one of the first Notified Bodies and has managed to reach a market share of over 75 per cent within 18 months after the Plan Review had become mandatory in early January 2010.

Since GL had plenty of experience certifying pleasure yachts to the European Directive EC94/25, the task of certifying racing yachts shorter than 24 metres came naturally to the German classification society. The existing ISO 12215 series of standards are binding for all one-off custom racers as well as all series production boats. Compliance must be confirmed by a Notified Body for each boat or model.







Photo: Stefano Gattani/Studio Borfenghi/Audi MedCup

**DYNAMIC.**  
TP52 "Quantum  
Racing" Audi  
MedCup, Cascais  
Trophy, May 2011.

Germanischer Lloyd was also put in charge of certifying the high-performance race boats of the TransPac 52 (TP52) class that serves as a competitive platform. Rob Weiland, the TP52 Class Manager, not only commissioned GL to carry out the mandatory ISAF Plan Reviews for all TP52 boats but also requested development of a new structural guide that would ensure an even higher degree of structural integrity than provided by the ISO standards. These GL Guidelines have been implemented in form of the TP52 Class Rules.

During the 2011 season, six GL-certified new builds are currently participating in the Audi MedCup racing circuit. At a time when the Americas Cup breaks new ground by introducing fast multihulls, and Maxi yacht owners can only compete under handicap rules, Luca Bassani, President of Wally Yachts and Wally Class, noticed the turn of the tide and launched a new class of highly competitive 100-foot cruiser-racers – the WallyCento. "We were asked by several passionate owners to create a fleet of yachts sharing a similarly high performance," explains Luca Bassani, Wally and Wally Class

President. "The goal is to have even more fun by increasing the closeness of the racing and the competitive level of our very comfortable and fully equipped cruising yachts."

Cento, meaning "one hundred", is the overall length in feet of the new cruiser-racers: "This is the perfect size," continues Bassani, "to combine absolute comfort, outstanding performance, and racing manoeuvrability. As a result, Wally-Cento boats will retain their value over the years and remain very competitive in the international racing circuit."

### New GL Guidelines for Racing Yachts

The lack of an ISO scantling standard for yachts longer than 24 metres prompted GL to begin developing a standard of its own, the "Guidelines for the Structural Design of Racing Yachts >24m". The requirements of these Guidelines have already been incorporated into the WallyCento Class Rules. This is an impressive confirmation of the trust that GL's capabilities and expert knowledge enjoy in the field of leading-edge racing yachts. ■ HH

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**WALLYCENTO.**  
"Magic Carpet 3"  
under design.

Rendering: Reichel/Pugh Yacht Design and Wally

ISAF

## Background

The ISAF Offshore Special Regulations (OSR) address monohulls and multihulls for offshore racing as well as structural features, yacht and personal equipment and training. The OSR are revised biennially, and amendment sheets are published detailing all changes made during the past review period. Following a working party review of keel failure incidents, the ISAF Offshore Committee approved an update to the OSR whereby new yachts racing in "offshore" categories 0, 1 and 2 must be constructed to one of the recently approved international yacht structure standards, i.e. ISO 12215. Yachts longer than 24 metres are subject to scantling rules issued by classification societies.



# Ships for the Energy Revolution

There is great demand for installation vessels for the erection of offshore wind farms. GL is playing a leading role in this innovative market

The offshore wind industry in Europe is poised for a boom. Over a dozen installation vessels are being planned, are under construction or were delivered only recently. Logistic service providers prepare the work assignments on the high seas and support the wind turbine installation ships (WTIS) with personnel, components and tools. Along the North Sea coast, small ports are systematically being developed into logistics bases for the wind energy industry. Engineers, technicians and skilled workers with experience in the offshore sector are in great demand. And the plant manufacturers are already testing prototypes with outputs of seven to eight megawatts and rotor diameters of some 170 metres. There is a feeling of optimism and awakening in the market for offshore wind turbines.

From the viewpoint of shipbuilding, this market is still quite small – but exceptionally innovative. “In Europe, 20 to 25 installation vessels will be needed in the short term. In the USA, the medium-term requirements are for five and in China for 20 more ships,” says Rasmus Stute. The offshore expert is Head of Department Offshore Service Vessels at Germanischer Lloyd, which has already classified 15 special

ships for the European market. GL’s strategy of expanding its know-how into this field at an early stage, through its new subsidiaries GL Garrad Hassan and GL Noble Denton, is now paying off.

The challenges posed by this market segment are immense. This concerns less the individual components than, for instance, the entire jack-up leg technology. “We need very big ships with extremely powerful cranes, a large elevating height, and a high level of availability. To cover the varied operating states of these ships, generators with outputs ranging up to 24 megawatts are installed on board. With this size and performance, we are pushing forward into entirely new dimensions,” Stute points out.

## Three Generations

The design of installation vessels of this size and with this performance calls for close interdisciplinary teamwork. Experts for ships and offshore installations, for wind turbines and for cranes agreed on a common terminology and specialist teams were lined up at GL. The outcome of this teamwork was the new Rules for Hull Structures of Offshore Serv-





ice Vessels in 2010, which also apply to installation ships. The technological evolution of this ship type can be traced through the development of the European fleet with GL class. Well-known and well-established technologies of the offshore industry were united here.

The first generation of installation ships were the barges and pontoons used as work platforms for harbour construction or the offshore industry. A typical example is the jack-up platform “Odin” owned by Hochtief. It does not have its own propulsion unit, and must therefore be towed to the site where the wind turbines are to be erected.

Hochtief’s jack-up platform “Thor”, which is already fitted with a 400-tonne crane and a dynamic positioning system, is likewise without its own drive but belongs to the



“ODIN”. Jack-up platform of the first generation.

second generation. This is also true of the jack-up barge “Wind Lift 1”, which Bard Engineering commissioned in 2010. “Wind Lift 1” is the pioneer amongst the new installation ships. It is self-propelled and boasts a 500-tonne crane. However, the lack of a fore ship gives the vessel the appearance of a traditional work platform. The self-elevating vessels “Victoria Mathias” and “Friedrich Ernestine”, delivered to RWE Innogy in autumn 2010, also dispense with a traditional hull shape. These ships do not actually require bows, as they are intended for constant deployment in the construction field and need not move at speed. Transport ships must then deliver the components. However, both ships display the progress achieved since “Wind Lift 1”: their cranes can lift greater loads, and the propulsive power is higher.

### Flexible Deployment

The third generation is much more versatile: ships like Hochtief’s “Innovation” or Swire Blue Ocean’s “Pacific Orca” and “Pacific Osprey” have very powerful cranes that can lift as much as 1,200 to 1,500 tonnes. Their exceptionally large deck areas permit the transport of bulky components, and also serve as assembly and work platforms. Because the hull has a pronounced bow and stern shape, relatively high speeds of up to 13 knots can be achieved with the vessel’s own propulsion system, allowing for these vessels to be deployed flexibly for both installation and transport tasks. ▶

**GL GUIDELINES.**  
*The “Rules for Hull Structures of Offshore Service Vessels (OSV)” came into force on 1 January 2010. A separate chapter is devoted to wind turbine installation ships (WTIS) with and without jack-up facilities.*



Photo: John Iken

**“THOR”.** Strong intermediate solution before the new generation of installation ships.



**“WIND LIFT 1”.** A pioneer amongst the new installation ships.



**“VICTORIA MATHIAS”.** Powerful cranes, but still no forebody.

► Owing to their long hulls, the “Pacific Orca” and “Pacific Osprey” are fitted with six elevating legs.

All of these designs are “conventional installation ships” for the successive erection of wind turbines. First, the foundations – monopiles, tripiles or jackets – are deposited in series by means of a small jack-up vessel or a jack-up platform. Then a second vessel erects the turbine in several crane lifts – starting with the tower sections, the nacelle, and then the rotor hub. The jack-up legs provide good stability for the installation platform. “In good weather, we need about 20 hours per turbine,” says Peter Frohböse, Head of Group Offshore at Garrad Hassan. “Within two hours, the ship is then lowered into the water and the jack-up legs are retracted. Now the vessel is ready to be towed to the next installation site.”

The “unconventional” method, on the other hand, involves the complete assembly of the wind turbines onshore. They are then pushed, standing upright, onto the deck of an installation vessel and placed on their foundations in the wind farm field. “Up until now, however, no vessel has been ordered for this installation method,” says Stute.

### Considering the Risks

At present, the wind energy industry is waiting for delivery of the installation ships on order. Then the real challenges will have to be faced: Have the logistics experts evaluated, planned and prepared all the business processes on board correctly? Any error in planning can have a disastrous effect, leading to high costs for each day that is lost. Another question is how the jack-up technology performs in rough swell, when the pitching of the ship makes the extended legs pound against the seabed, which would endanger the entire structure.

Perhaps the greatest risk with crane work is strong wind. When hoisted, the rotor blades can act as aerofoils. The dangers are monitored by the marine warranty surveyor, who represents the interests of the underwriters and fulfils an important function on board. GL is active as a service provider

in this field too: GL Noble Denton has developed its own guidelines for marine warranties and also acted as marine warranty surveyor for the EnBW “Baltic 1” wind farm project in the German part of the Baltic Sea. ■ HS

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#### SWIRE BLUE OCEAN

## Pacific Orca/Osprey

Identical offshore installation ships were completed in the summer of 2012. The “Pacific Orca” and “Pacific Osprey” can operate almost entirely independently of the weather. They meet the latest safety and environmental standards and are classed by GL. The ships are self-propelled (13 knots) and can each transport twelve wind turbines with the towers preassembled. Thanks

to their enhanced stability through the extension of six legs and a jacking function for water depths up to 75 m, these installation ships are able to mount the turbines onto the foundations in the North Sea, even for a significant wave height of 2.5 m and wind speeds up to 20 m/s. The main crane lifts up to 1,200 tonnes, and the total jackable weight is 8,400 tonnes.

#### SWIRE BLUE OCEAN.

The Danish shipping company is to deliver and erect 80 turbines for the “Dan-Tysk” wind park project.

Illustration: Swire Blue Ocean





# It Can Be Done

With new carbon emission standards ahead, the successful conversion of the “Bit Viking” to LNG fuel leads the way towards low-emission shipping

The first GL-class ship operating on liquefied natural gas (LNG), the 25,000 dwt product tanker “Bit Viking”, is scheduled to complete sea trials in September and begin commercial operation. The ship’s former oil-burning engines have been converted into dual-fuel engines capable of switching between LNG and fuel oil. It is the first conversion of a vessel in service to an LNG-fuelled vessel ever. Owned by Sweden’s Tarbit Shipping and operated by oil major Statoil, “Bit Viking” now qualifies for lower nitrogen oxide (NO<sub>x</sub>) emission taxes under the Norwegian government’s NO<sub>x</sub> fund scheme, due to substantial reductions in her carbon emissions.

GL experts verified the plans and drawings, monitored the final installation of the parts at the shipyard and are undertaking the sea trials.

## Not an Easy Retrofit

The technical challenge of the conversion was immense, says Ronnie-Torsten Westerman, Business Development Manager at GL Group in Norway. “It was a very extensive retrofit because we had to increase the bore of the engine from 46 cm to 50 cm, so most of the individual parts of the two engines had to be replaced.” Safety is also a key concern in the LNG conversion process. “We are dealing with something that is not so much explosive as cryogenic,” says Westerman. “For example, if we get a spill on the deck it can destroy the steel and you then have to cut it out or replace it as the steel will get brittle if it comes into contact with liquid gas.”

The “Bit Viking” is likely to galvanise interest in dual-fuel tankers. Experts predict that the number of ships powered by LNG may rise tenfold within the next five years, as anti-pollution measures force owners to switch to cleaner-burning energies. ■ JG

## FOR FURTHER INFORMATION:

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## LOW EMISSIONS.

With her dual-fuel propulsion system, “Bit Viking” demonstrates environmental commitment.

## Landmark Conversion

The Bit Viking’s twin-screw propulsion system features double engine rooms, propellers, steering gears, rudders and control systems. Her 6-cylinder in-line Wärtsilä 46 engines were converted by Wärtsilä into 50DF dual-fuel engines. With her two newly installed 500-cubic-metre LNG storage tanks, the vessel will have a range of twelve days. The “Bit Viking” is now considered as one of the safest and most environment-friendly ships of her size and type in the world.

GL played a critical role in the conversion process by ensuring that the manufacture and installation of all components was done in accordance with the applicable standards.

Read more about the conversion of the “Bit Viking” in the next issue of *nonstop*.

## Bit Viking Facts

- Class: GL\* 100A5 E3 ESP IW NAV-OC
- Chemical Tanker Type-2
- Deadweight: 25,000 MT
- Owner: Tarbit Shipping AB
- Built by Shanghai Edward Shipbuilding, China 2007
- Two 6-cylinder in-line Wärtsilä 50DF
- LNG Storage: Two 500 m<sup>3</sup> tanks

Photo: fotoflitt

# From Inspector to Advisor

The new management structure for the GL business segment Maritime Services enhances its efficiency and strengthens customer focus

The course has been set for a successful future: Germanischer Lloyd has reorganised the executive structure of its Maritime Services, effective as of 1 July 2011. The operational business will be handled by Erik van der Noordaa, Chairman of the Executive Board of the GL Group, Dr Tjerk De Vries in the position of Chief Technical Officer, Torsten Schramm as Chief Operating Officer, and Albrecht Grell as Head of the business unit Maritime Solutions. In this issue of *nonstop*, Schramm, Grell and de Vries explain the goals of the restructuring and speak about the challenges facing the classification society.

**NONSTOP:** Mr Schramm, what do you intend to gain from the new management structure of the Maritime Services?

**TORSTEN SCHRAMM:** There are now clear responsibilities for the field service and sales on the one hand, and for Head Office with Plan Approval and Strategic Research on the other hand. This will make the internal processes more efficient – which will ultimately benefit our customers.

**DR TJERK DE VRIES:** The organisational restructuring is the outcome of an even stronger and more systematic focusing of the Maritime Services on the needs of our customers. The business of a classification society is much more complex today than it was only a few years ago.

Technical surveillance of ships on the basis of the GL Rules and international regulations remains a core task but, more than ever before, the class has to be an all-round service provider. In view of the complex technical challenges, for example regarding energy efficiency, shipping companies and also ship management firms can no longer keep up with the necessary expert knowledge. The need for advisory services is correspondingly high.

**NONSTOP:** What role does consultancy play in GL's current service portfolio?

**ALBRECHT GRELL:** A strongly increasing role! In particular, the services aimed at energy efficiency in the design and operation of ships offer solutions to the most urgent questions our customers pose today: How can I boost my level of competitiveness? How can I really reduce the largest cost item for the industry – bunker expenses – but keep up the same performance? Because the relevant solutions of our consulting subsidiary FutureShip soon lead to substantial cost reductions for our customers, we see an immense demand ahead. As a result, the financial and strategic weighting of the advisory services will of course increase for GL.

**SCHRAMM:** In this connection, the role of our surveyors has also changed. The era of the dedicated inspector has passed; what is now needed is a versatile technical advisor. These experts act as GL's ambassadors to the customers and, through their daily contact, exert a decisive influence on whether a client is truly satisfied and is possibly also willing to extend his relations with us.

**DE VRIES:** Of course, this is not a one-way street. It goes without saying that we want to win over clients who already avail themselves of our advisory services, but have entrusted the classification of their ships to another society, by convincing them of the superior quality of our work and the good customer focus throughout the entire enterprise.

**NONSTOP:** What new products are currently of special interest?

**GRELL:** At present, this undoubtedly concerns all the products that help our customers increase the energy efficiency of their ships. To this end, we are investing appreciable effort in continuous advancement and in additional offers to complement and expand our spectrum of services in the areas of ship design and ship operation.

Here I see a mega-trend which will define the market and characterise our business for many years to come. Energy efficiency unites two dimensions of our corporate mis-





## Maritime Management

**ALBRECHT GRELL** continues to head the business unit Maritime Solutions and remains responsible for the business areas of consultancy, engineering, certification, software and training.

**DR TJERK DE VRIES**, as Chief Technical Officer (CTO), is responsible for Fleet Service, Ship Newbuilding, Maritime Systems and Components, Strategic Research and Development, and Process Improvement.

**TORSTEN SCHRAMM** is responsible for GL's business activities worldwide as Chief Operating Officer (COO). In addition, he takes on Sales & Business Development for the Regions Europe/Middle East/Africa, Asia/Pacific, and the Americas.

sion in a very elegant manner: "greener" and "smarter" – foremost topics for our customers and the whole GL Group.

**NONSTOP:** GL has doubled the size of its fleet to 100 million GT in only six years. What does this milestone mean for the customers of GL?

**DE VRIES:** 100 million GT – that is an impressive figure and a great success for GL. With that, we have bolstered our position amongst the world's five largest classification societies. This strong growth gives us the possibility of expanding our global network and reinforcing our customer focus.

For this reason, we have been able to win over increasingly more international customers in the past years, specifically in the segments of containerships and multi-purpose

cargo vessels. What is more, our economic success allows us to work more intensively on the new development and advancement of our services and our product range.

**SCHRAMM:** Good examples here include "GL HullManager" for enhanced maintenance support over the entire lifecycle of a ship, and the expansion of consulting in the business area of Maritime Solutions. Above all, it is important for us to offer high-quality services and, despite rapid growth, to strengthen the personal relationships with our customers.

**GRELL:** The trusting cooperation with our clients and the high level of technical competence displayed by the GL staff members are, after all, the solid foundation for the steady rise in GL's market share, and also provide an excellent footing for the work outside of classification. ■ AM

# Maritime Milestones

In 2011, Germanischer Lloyd passed the tonnage mark of 100 million GT.

Founded more than 140 years ago, the history of the company is rich in maritime milestones. From interesting to spectacular, here are 20 facts about GL



The first ship register of 1868 listed **273** sailing ships, comprising **272** wooden vessels and **1** iron ship.



**600** Almost 600 interested parties came to the inaugural meeting on 16 March 1867.



At **161,306 GT**, the "Nordenergy" is the largest tanker classified by GL.

**161,306**

The engine of the "COSCO Ningbo" has an output of **74,760 kW** – the strongest of all ships with GL class.

Given favourable winds, the cargo vessel "E-Ship 1" can do completely without its diesel drive and move forward solely through the wind energy harvested by **4** Flettner rotors.



Photo: Lech Dobrosielski

**100** 2011: the total tonnage classified by GL

2005: for the first time, GL passes the **50 million GT** mark.





The "MSC Daniela" was GL's first 10,000 TEU ship.

10,000



People from a total of 95 nations work for GL all around the globe.

208

GL operates 208 branch offices in more than 80 countries worldwide.

366

With a length of more than 366 metres, the "Maersk Emden" is GL's longest ship.



Photo: Maersk Line



The heaviest ship ever classified by GL is the "Paradise N" boasting 322,398 dwt.



In total, GL now has 7,201 ships in class. As per 25.08.2011



14,069  
GL currently attends to 14,069 customers

Named after the Nordic god of thunder, the GL-classed "Thor" is one of the world's largest jack-up platforms for the erection of wind turbines.

The Capesize bulk carrier "E.R. Bayern" was the 7,000th vessel classed by GL.

Photo: Deutsches Schifffahrtsmuseum



The oldest GL-classed ship still under way is the "Grönland", built in 1867.

44.8

With 14,000 twenty-foot equivalent units (TEU), the "MSC Savona" offers the greatest capacity for standard containers in the GL fleet.

14,000

GL's share of the container fleet in service worldwide is 44.8%.

worldwide reaches 100 million GT.

# Rules for Classification and Construction

Our latest brochures, rules and guidelines are available on request. Order forms are available on the Internet: [www.gl-group.com](http://www.gl-group.com) > Rules & Guidelines

## I – Ship Technology

**Part 0 – Classification and Surveys**  
2011-05-01

### Part 1 – Seagoing Ships

**Chapter 1**  
Hull Structures 2011-05-01

**Chapter 2**  
Machinery Installations 2011-05-01

**Chapter 3**  
Electrical Installations 2011-05-01

**Chapter 4**  
Automation 2011-05-01

**Chapter 5**  
Structural Rules for Container Ships 2011-05-01

## IV – Industrial Services

### Part 6 – Offshore Technology

**Chapter 8**  
Guideline for the Certification of Blow-Out Preventers 2011-05-01

## V – Analysis Techniques

### Part 1 – Hull Structural Design Analyses

**Chapter 1**  
Guidelines for Global Strength Analysis of Container Ships 2011-02-01

## VI – Additional Rules and Guidelines

**Part 12 – Environment Protection**  
**Chapter 1**  
Guidelines for the Environmental Service System 2011-08-01

**IACS Common Structural Rules and GL Complementary Rules**  
**Bulk Carriers**  
**Volume 2**  
Complementary Rules 2011-05-01

**Double Hull Oil Tankers**  
**Volume 2**  
Complementary Rules 2011-05-01

## CD-ROMs

**GL Rules and Programmes 13.0**  
Selected Rules & Guidelines incl. Programmed Hull Structural Rules for Specific Ship Types 2011

**Poseidon ND 11.0**  
Strength Assessment Tool for Hull Structures of Seagoing Ships 2011

**MLC, 2006**  
E-Learning Tool for Maritime Labour Convention, 2006 2011

# Dates at a Glance

For further dates and additional information, see [www.gl-group.com/events](http://www.gl-group.com/events)

## September

12.09.2011  
**IMCA Vessel Assurance Workshop**  
Aberdeen, UK

14. – 15.09.2011  
**6th GreenPort Congress**  
Hamburg, Germany

14. – 16.09.2011  
**Ergoship 2011**  
Gothenborg, Sweden

18. – 21.09.2011  
**International Union of Marine Insurance 2011 Annual Conference**  
Paris, France

20. – 22.09.2011  
**International Conference on Computer Applications in Shipbuilding (ICCAS 2011)**  
Trieste, Italy

27. – 28.09.2011  
**Marine Money Asia Week**  
Singapore

27. – 29.09.2011  
**Seatrade Europe**  
Hamburg, Germany

28. – 30.09.2011  
**Green Ship Technology Asia**  
Singapore

## October

03. – 05.10.2011  
**Middle East Workboats 2011**  
Abu Dhabi, United Arab Emirates

26. – 29.10.2011  
**Kormarine**  
Busan, Korea

## November

09.11.2011  
**International Marine Contractors Association (IMCA)**  
New Orleans, USA

29.11. – 02.12.2011  
**Marintec China 2011**  
Shanghai, China

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# Vision

“We will be the most respected international technical advisor and trusted partner by being world-class in all we do.”

We will achieve our vision:

- Through our unique combination of technical expertise, business understanding and client relationships.
- By drawing on our global network to grow and consolidate our reputation within all of our markets.
- Through our exceptional people, their creativity, ambition and drive.

# Mission

## Safer

We drive a safety culture that prevents loss or harm to people and assets.

## Smarter

We use our expertise, our wealth of experience and our comprehensive global network to deliver superior results.

## Greener

We apply our learning to inspire our clients and colleagues to lower their environmental impact and help shape a greener future.

# Values

Enhance  
Trust.

Embrace  
Change.

Deliver  
Results.



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