

Germanischer Lloyd

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nonstop

the magazine for customers and business partners

LNG

Towards a Clean Future

KNOW-HOW A Fleet for Tough Jobs

CERTIFICATION One-Stop Service

EXTRA Simulating Megayachts



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- Guidelines

Dear Readers,



Erik van der Noordaa

THE DURBAN CLIMATE CHANGE CONFERENCE in December has not delivered the breakthrough many had hoped to see. Nevertheless – even though the mills of international politics grind slowly – climate change and its dire consequences still belong to the greatest challenges facing humanity: in 2010, the global emissions of CO₂ increased by six per cent, rising further over the past year.

THE SHIPPING INDUSTRY IS FACING UP TO ITS RESPONSIBILITY for the environment. Design offices, shipyards, engine manufacturers and equipment suppliers alike are diligently working on optimising what is already the cleanest mode of transport. We at GL are supporting the industry at all levels with our expertise for making ships even more efficient and environmentally friendly.

A key topic in this connection is LNG as an alternative to conventional fuels (page 12). At an early stage, the research and development department of GL conducted studies which indicated that LNG drives are indeed economical. At the same time, our experts were also working on practical applications in ship operation – a spectacular example of this is the retrofitting of the “Bit Viking” (page 16), which showed that the fleet in service can also become greener by using customised technology.

A RANGE OF OFFERINGS specifically tailored to meet the particular requirements of its customers is what has brought resounding success to the German shipping company Briese (page 30). In our interview, shipowner Roelf Briese discloses how the company is constantly reinventing itself to master crises and open up new markets – and how important a close dialogue with the classification society really is. Optimisation of quite another kind is being performed by the yacht experts of GL: with state-of-the-art simulation, they not only make these sophisticated boats more streamlined, but also safer (page 35).

A GREAT LEAP FORWARD has also been taken by our GL Systems Certification unit. Whether ISM, ISPS, ISO 9001 or ISO 14001: through the integration of maritime safety management, customers now obtain one-stop certification according to the most diverse standards – only recently, the 5,000th ship successfully passed GL’s ISPS audit (page 42).

Local presence is a major priority for us, also in the literal sense. To the benefit of its customers, GL is based in 200 locations worldwide. Environmental protection, quality and safety: what maritime challenges can we solve for you?

Yours sincerely,

ERIK VAN DER NOORDAA

Chairman of the Executive Board, Germanischer Lloyd SE

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Photo: Michael Bogumil

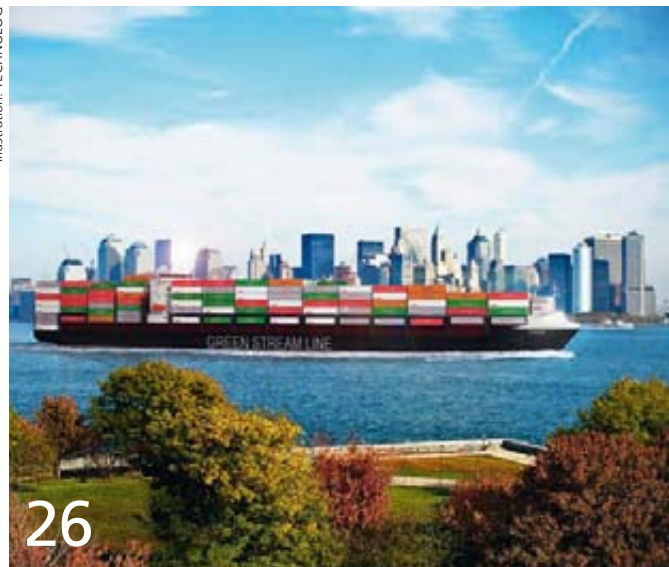


Illustration: TECHNOLOG

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Photo: Caterpillar Marine Power Systems



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Cover Photo: Tarbit Shipping

Efficient Ship Christening

It was a truly special event: Hamburg shipowning company E.R. Schiffahrt christened the first two of a new series of giant containerships at Ulsan, South Korea. Capable of carrying 13,100 standard containers and measuring 366 metres in length and 48.2 metres in width, the vessels have a 15.5 metres draught and are among the largest ships ever to sail the seven seas.

"E.R. BENEDETTA" AND "E.R. CRISTINA" are vessels no. 100 and 101 that the shipping company, established in 1998, has ordered. Six additional 13,100-TEU sister ships are still under construction and will be

delivered by Hyundai Heavy Industries, the world's biggest shipyard, in 2012.

All ships of the series can run on low-sulphur fuel and carry GL's Environmental Passport. This confirms that they are state-of-the-art in terms of technology and environmental compatibility, helping to reduce emissions to air and water.

These next-generation, highly efficient large containerships emit approximately 30 per cent less CO₂ per container than a 8,500-TEU vessel, while their fuel consumption, in spite of the higher cargo capacity, is nearly the same.





CONGRATULATIONS!
NAMING OF "E. R. BENEDETTI"

Congratulation

news

CERTIFICATE

Five Stars for Quality and Safety

SHIPOWNER ERNST RUSS (ER) has always been a steadfast supporter of high quality, safety and environmental standards in the shipping industry. This has not gone unnoticed: recently ER was awarded Germanischer Lloyd's "GL Excellence – 5 Stars" certificate. "A strong commitment to the highest standards of safety and quality is a prerequisite for successful cooperation with our international partners and customers. We are therefore extremely pleased to find our position highlighted by this award," said ER Managing Director Stefan Bülow.

"GL Excellence" certification is an independent confirmation of a shipping com-



Photo: Hasenpusch



AWARDED. Five Stars for Ernst Russ: Managing Director Stefan Bülow (ctr. l.) and Jan Stahmer (ctr. r.) receive the cherished certificate from Dirk Lange (l.) and Matthias Ritters (both GL).

pany's voluntary commitment to continuous improvements in the areas of quality, environmental awareness, reliability, safety and social responsibility. The ER fleet fulfils the requirements of the ISM Code (International Safety Management), the ISPS Code (International Ship and Port Facility Security) as well as ISO standards 9001 (quality) and 14001 (environment). Compliance with the requirements for "GL Excellence – 5 Stars" certification is reassessed every three years concurrently with the ISM and ISO surveys.

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COATING.
 Protection for ship hulls against corrosion.

CONFERENCE

Corrosion Protection in Maritime Engineering

DEVELOPING STRATEGIES to combat corrosion on ships and maritime structures requires both experience and expertise in planning, manufacture, operation and maintenance. The business, science and industry experts attending the 11th "Corrosion Protection in Maritime Engineering" conference in Hamburg have both. On 25 and 26 January 2012, eight lectures will provide insight into current trends and application-oriented solutions.

The conference programme will address topics such as organic coatings, which con-

tinue to play an important role. Two presentations will investigate ways of improving the properties of corrosion-resistant steels.

Other topics on the agenda are corrosion protection of ballast water tanks, corrosion protection of mechanical structures, and damage analyses.

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Photo: Dreamstime/Glenjones

UPDATE.
The latest news
with GL Focus.



STEEL FORUM

Countdown for DIN EN 1090

SEVERAL EXISTING ENGINEERING standards, such as DIN 18800-7 for steel structures and DIN V 4113-3 for aluminium structures, will soon be replaced by a single new one. The new rules of DIN EN 1090 will take effect in July 2012, an important date for all manufacturers of these structural products. On occasion of a steel forum held in Magdeburg, Germany, GL experts discussed the consequences of the new standard for manufacturers of welded steel and other metal structures, such as industrial buildings, bridges, wind turbines or cranes.

“The requirements weld shops must satisfy have changed significantly under DIN EN 1090, especially with respect to

the documentation of all work carried out,” says GL expert Marcus von Busch. During the present transition period, metal structures may still be completed in accordance with the previous national rules. Effective 1 July 2012, however, no structural products may be marketed in Europe without CE marking.

DIN EN 1090 defines engineering requirements for the construction of load-bearing structures from CE-labelled steel and aluminium products. In addition, the new standard describes the quality management system any manufacturer of steel structures must have in place to demonstrate compliance with the standard.

INTERNET

Perspective on the Latest Developments

GL RECENTLY INTRODUCED a new online service: GL Focus – Regulatory and Technical Update. GL Focus offers comprehensive and timely information on new maritime regulatory developments concerning the GL rules and from the International Maritime Organization (IMO), flag states as well as Port State Control. It also includes guidance and interpretation from GL experts.

FOR FURTHER INFORMATION:

www.gl-group.com/gl-focus



Photo: Dreamstime/Crokogen

01/2012

GL RULES

Update for Inland Navigation Vessels

TO ENSURE CONTINUING SAFETY and to promote the efficiency of inland waterway transport, GL has released an update to the GL Rules for Inland Navigation Vessels (INV). The update to the rules came into effect on 1 November 2011 and consists of rules for classification and surveys; hull design and construction; machinery, systems and electricity; and additional requirements for notations.

A major impetus behind the update is to ensure that vessels comply with the latest GL

regulations of the European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN).

The update comes at a key time for the inland navigation vessel market as its importance as a core part of the freight network is set to grow. With pressure spreading across the transport industry to curb carbon emissions, the European Commission has targeted a shift of 30 per cent of long-distance road freight to rail and waterborne transport by 2030. The development of inland waterways is also being targeted as a key part of this strategy.

DOWNLOAD. www.gl-group.com/infoServices/rules/pdfs/english/qlrp-e.pdf

news



WINNERS. (f.l.t.r.) Torsten Schramm, COO of GL, with Edward Sciberras, Katja Hartig and Fabian Tillig.

GL AWARD

Young Professionals

THREE YOUNG ENGINEERS have been rewarded for their outstanding diploma theses by Germanischer Lloyd. For the GL Award for Young Professionals 2010 engineering students were asked to submit theses on "Innovative Ideas for Increasing the Energy Efficiency of Ships". Torsten Schramm, Chief Operating Officer of the GL Group, presented the prizes to the deserving winners at the Maritime Summer Meeting in Kiel.

The awards come with a prize of 1,000 to 3,000 euros. Edward Sciberras, studying at the University of Newcastle, won first prize for his thesis on the "Sizing of Hybrid Propulsion Systems". Second prize went to Katja Hartig of the University of Rostock for her paper "Conceptual Design of a Containership not Requiring Ballast Water Exchange." Fabian Tillig from the Berlin Institute of Technology took third prize for his work "Parametric modelling and hydrodynamic analysis of twin-skeg vessels."

MLC 2006

GL Clients are Able to Apply for Certification of their Antigua- and Barbuda-Flagged Ships

THE MARITIME ADMINISTRATION of Antigua and Barbuda has authorised GL to carry out inspection and certification services under the Maritime Labour Convention 2006 (MLC 2006). Antigua and Barbuda ratified the Convention last summer, giving complete effect to the Convention and have implemented the related national requirements in the Antigua and Barbuda Maritime Legislation. Ships with the Antigua and Barbuda flag can request certification for voluntary compliance prior to the anticipated entry-into-force date. GL as a Recognised Organisation acting on behalf of the flag state is now additionally authorised to conduct MLC 2006 related review, inspection and certification tasks.

"This authorisation puts our clients into the convenient position of being able to apply for certification of their Antigua- and Barbuda-flagged vessels in advance of the Convention's entry

into force. This will ensure a smooth, speedy transfer to MLC 2006 certification, avoiding possible bottlenecks and delays that could arise in 2012 and 2013," says GL expert Olaf Quas. GL provides a comprehensive all-round package through its ILO CERT service including: the MLC ANALYSER, a self assessment tool which enables ship managers to assess their ships' compliance and the MLC PRE CERT, a voluntary statement of compliance that guarantees transfer to the Maritime Labour Certificate.

In addition to the certification programme, GL offers international workshops and seminars and has also released the first e-learning tool covering the Convention (see also page 42).

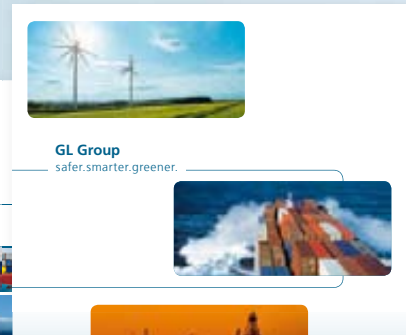
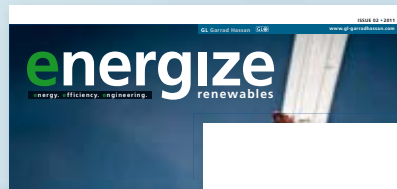
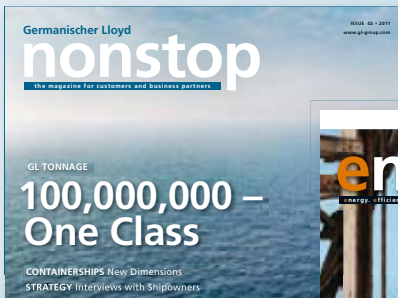
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FLAG STATE. The fleet of Antigua and Barbuda counts over 1,000 vessels.

Illustration: Dreamstime/Smicholl



ICMA Awards for GL Group Magazines

CREATIVE DESIGN, HIGH OVERALL QUALITY – the jury in the International Corporate Media Award (ICMA) has acknowledged outstanding achievements of the corporate media segment. The GL Group's customer magazines were among the top-rated publications: as many as five of them –

including *nonstop*, *energize renewables*, *energize oil & gas*, *the Annual Report* and *the Company Brochure* – received the "Award of Excellence", and *nonstop* and *energize oil & gas* each won an additional prize. Overall, 214 publications had entered the competition for the second ICMA awards.



SUCCESS. The ICMA jury scrutinises the quality of corporate media products.

SPECIAL CONFERENCE

Welding Technology Trends

FROM SHIPBUILDING to offshore platforms, welding is a universal technology. Beyond maritime applications it also plays a crucial role in the design, construction and repair of land-based structures. The 13th Special Conference on Welding in Shipbuilding and Civil Engineering 2012, held on 26 April in Hamburg, will provide a platform for industry experts to discuss current trends, new methods and innovative products. Standards and certification, structures, process engineering and wind energy will be the key topics on the agenda. The main focus of this conference will be on efficiency enhancements leading to improved welding results.

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DSME

First-Ever Solution to LNG-Fuelled Large Container Vessels

THE PROMISING FUEL ALTERNATIVE, LNG, has not been used for container vessels. DSME and Germanischer Lloyd (GL) have proved the feasibility of running large container vessels on LNG in a recently completed joint project. In the last month, both partners have made major steps forward towards developing LNG-fuelled large container vessels. GL has recently finished approval in Principle of a 14,000 TEU LNG-fuelled container vessel for DSME.

"New technology is needed as there is an increasing demand for cleaner transport and maritime environmental regulations are becoming ever stricter," said Frederick Ebers, Vice President and Area Manager North East Asia, GL. "DSME and GL have acknowledged this challenge and agreed in 2010 to jointly start exploring technology options and safety



PRESENTATION. (f.l.t.r.) Hyung-Kyun Seo (Vice President, DSME), Jun-Seob Shin (Executive Vice President, DSME), Frederick Ebers and Gerd Michael Würsig (both GL) at a press conference at the Kormarine Trade Fair in Busan in late October 2011.

concepts for large LNG-fuelled container vessels."

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LNG Heralds a New Era in Ship Propulsion

As an important step towards improving energy efficiency and reducing emissions, LNG as a ship fuel is attracting more and more attention.

In a conversation with *nonstop*, Dr Gerd-Michael Würsig, Deputy Head of Environmental Research at GL, explains how this alternative fuel may soon drive change in the shipping world

LNGPAC.
Wärtsilä's LNG solution comprises onboard liquefied natural gas bunkering, two storage tanks and handling equipment with related safety and automation systems.

NONSTOP: What are the major advantages of using liquefied natural gas (LNG) as a ship fuel?

WÜRSIG: The use of liquefied natural gas as a ship fuel has both environmental and economic advantages, but primarily environmental ones. LNG contains no sulphur and therefore causes no sulphur emissions. Furthermore it has the potential to reduce CO₂ emissions from shipping compared to heavy fuel oil because of its lower carbon content.

The economic advantages will mainly show in those areas where marine gas oil (MGO) will have to be used in the near future. In the long run, LNG is anticipated to deliver a cost benefit over MGO.

NONSTOP: How many LNG-powered vessels does the world fleet have at present?

WÜRSIG: Some 20 vessels. Most of them are small ferries operating along the coast of Norway where a supply infrastructure for LNG as a ship fuel is already in existence. In addition there are some offshore supply vessels and patrol boats.

The largest vessel operating with LNG as fuel is the GL-classed "Bit Viking" (see page 16), a chemical tanker owned by our client Tarbit Shipping. The vessel has been converted by Wärtsilä and is equipped with the first LNGPac developed by Wärtsilä.

NONSTOP: Could containerships operate on LNG?

WÜRSIG: To date, LNG has never been used for container vessels. But it would be feasible for container vessels to operate on LNG, provided they have access to a refuelling infrastructure. Container vessels have great potential to be among the first cargo vessels running on LNG though I cannot tell you which one will be the first to seize the opportunity: for feeder ships, using LNG propulsion within ECAs seems an attractive option; as for very large container vessels, the number of stakeholders involved is small so all we need is container liners and fuel suppliers to agree on using LNG as ship fuel in the future. I believe this will happen sooner rather than later. Right now we are still in the conceptual design stage for LNG as a fuel for containerships, including feeders. But I believe it is safe to assume that this development will pick up speed very soon.

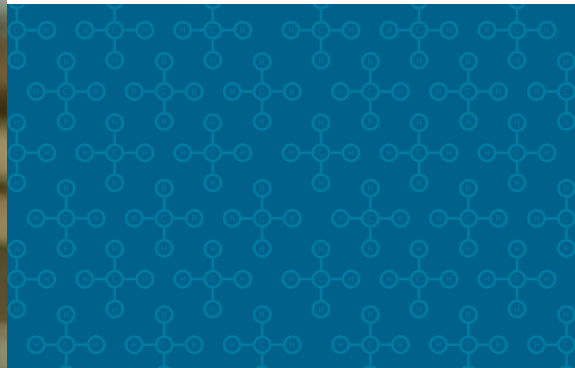
NONSTOP: How can you bunker LNG? Is it safe to install tanks on board?

WÜRSIG: At the moment, bunkering takes place at stations located at specially equipped terminals. The vessels are taken out of service for bunkering. This is similar to the normal procedure at gas terminals. But I believe we will eventually ▶



FUTURE.

Dr Würsig is convinced that a new era of LNG vessels is set to come.



Curriculum Vitae

Dr Gerd-Michael Würsig holds a Master of Science degree and a PhD from Hannover University.

He has been specialising in process technology and liquefied gas transport topics since the late 80's. At GL he is in charge of Gas Technology Coordination as well as fuel cell systems and hydrogen projects. Regarding IMO-related activities, he is an advisor to the German Ministry of Transport in matters relating to the IGC and IGF Codes; he also represents GL at SIGTTO.

Photo: Michael Bogumil

► see an LNG bunkering procedure that follows the same pattern as with heavy fuel oil. In other words, vessels will be fuelled during cargo operations. There is also the option of using gas carriers or special barges for refuelling, provided they are properly equipped and carry enough gas even for large ships. Gas tankers as such do not pose any particular hazards. As long as gas spills are avoided effectively, the gas in the tanker is in a safe state regarding boil-off, and possible flashing at the receiving vessel can be prevented by adequate means.

NONSTOP: What are the major technical challenges?

WÜRSIG: The key technologies and systems are fully mature and in use. Technical challenges remain with certain aspects

tankers capable of distributing LNG from import terminals are already in existence. Our client Norgas operates six small gas carriers that can be used to supply LNG to small terminals in ports that have an LNG infrastructure for ship fuelling. So the only thing we need is storage facilities; the technology is fully available. In fact, Norway has this infrastructure in place today.

NONSTOP: When do you think this infrastructure will be available commonly?

WÜRSIG: That depends on the progress made by the individual projects. Some projects are in the implementation stage now, others are pending, so it is hard to make any predictions. But as more LNG vessels will be entering service after 2015, they will depend on the availability of adequate refuelling stations in ports.

of practical implementation, such as safe bunkering. Solutions are still under evaluation but will be available very soon.

NONSTOP: When do you think LNG-powered vessels will enter the mainstream?

WÜRSIG: We will see them in growing numbers over the next few years in parallel with the enforcement of new environmental regulations. We expect some initial projects to be under contract by 2012 or 2013. LNG-powered ships are likely to become more common during the second half of this decade, beginning around 2015. The new regulations force owners and operators to either change the fuel or invest in exhaust-gas cleaning systems.

NONSTOP: Will LNG eventually replace conventional fuel?

WÜRSIG: Yes, it will, at least as far as MGO is concerned. MGO and LNG will compete in the market for some time, but I believe the advantages are on the side of LNG.

NONSTOP: What is the developmental status of the LNG supply infrastructure?

WÜRSIG: It is relatively easy to deploy a distribution and re-distribution infrastructure for smaller ship types, such as RoRo ferries, tugs or even naval vessels and container feeders. Gas

LNG Import Terminals and Hubs

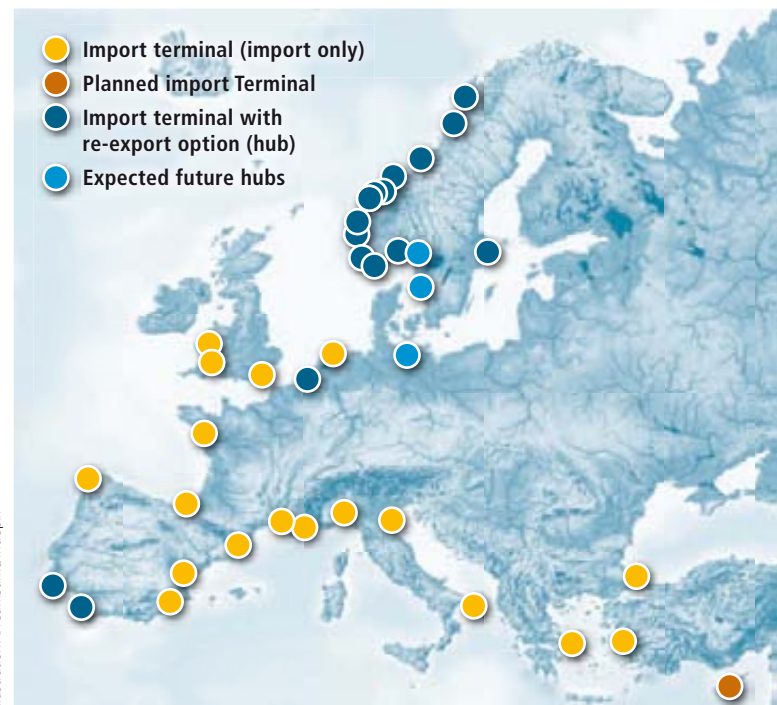




Photo: Michael Bogumil

out doubt be allowed to operate even after the IGF Code becomes effective. So there is no reason for anybody to hesitate building a gas-fuelled ship for fear that the interim guidelines might be overruled. The only factor to consider is that the interim guidelines require owners to obtain permissions from flag states and port states to operate their vessels. This makes things a bit complicated for operators calling at different ports or port states. The IGF code, which is expected to come into force in 2014, will eliminate this issue and play a major role in promoting the large-scale use of LNG as a ship fuel.

NONSTOP: How has GL contributed to the development of LNG-fuelled vessels?

“Solutions are still under evaluation but will be available very soon.”
DR GERD-MICHAEL WÜRSIG, Germanischer Lloyd

NONSTOP: What will come first, infrastructures or LNG vessels?

WÜRSIG: That seems to be a chicken-or-egg question. Both have to develop simultaneously. The very first vessels will be operating closely to the first ports equipped with a refuelling infrastructure. For instance, the port of Rotterdam found that there are large numbers of small vessels calling every week. These ships could be refuelled every time they call at the port. Many of them are GL-classed. It will be quite easy to retrofit them for LNG as a fuel. Furthermore, the Netherlands is implementing four different projects along the Rhine to provide LNG refuelling stations for inland vessels. These facilities should be operational within the next 18 months.

NONSTOP: Will these vessels be dual-fuel or exclusively LNG-fuelled?

WÜRSIG: Most of the existing vessels are exclusively gas-powered. Most of the new projects are dual-fuel, however. For commercial and sea-going vessels, dual-fuel is obviously the most advantageous and promising option.

NONSTOP: Are there any restrictions in terms of rules and regulations?

WÜRSIG: Right now builders can use the interim guidelines of MSC.285(86). Ships built according to these rules will with-

WÜRSIG: GL has been working on a number of projects involving gas as a ship fuel and is participating in the development of the IMO rules for gas as a ship fuel on behalf of the German government. As partners in the joint projects GASPAX, BunGas and Helios, we have developed safe and innovative solutions for gas-fuelled passenger vessels, refuelling requirements and dual-fuel solutions for two-stroke engines. In 2009 we prepared a conceptual study for a 900 TEU container vessel together with MAN and TGE-Marine Engineering, and this year we finished Approval in Principle projects with DSME for a 14,000 TEU, LNG-fuelled container vessel as well as a 4,200 TEU containership owned by TECHNOLOG (see page 26).

NONSTOP: What key messages would you like to deliver to our clients?

WÜRSIG: Don't hesitate to go ahead and develop vessels of this type. They will be a reality very soon. ■ ZL

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Mission Accomplished



The “Bit Viking” is the world’s first vessel converted to run on LNG while in service. After successful sea trials under GL supervision, the vessel has resumed commercial trading

LNG.
Liquefied natural gas is natural gas converted to liquid form by cooling it to $-162\text{ }^{\circ}\text{C}$.

The “Bit Viking” is the result of GL’s participation in the conversion of an existing oil-burning engine into a dual-fuel one that can burn either fuel oil or gas. The project has put the GL Group centre stage in the development of LNG-fuelled vessels. The “Bit Viking” is now capable of switching between LNG and fuel oil.

Ronnie-Torsten Westerman, Business Development Manager at Germanischer Lloyd, recalls the beginnings: “The project started with a kick-off meeting of representatives from Wärtsilä, the owner Tarbit Shipping, and GL in April 2010.” Because of its broad LNG expertise, GL was chosen for the classification part of the conversion. Manufacturing of various new components began in early 2011. The components were then transported to the shipyard in Landskrona, Sweden. “The ‘Bit Viking’ arrived at the yard on time and the conversion commenced in August,” reports Westerman. The new equipment necessary for LNG operation was installed in the vessel.

Germanischer Lloyd staff played a critical role in this process, monitoring the manufacture and installation of the components, such as piping, valves, safety equipment and LNG tanks, and ensuring safe construction, use of suitable materials and application of appropriate welding methods.

Official Sea Trial

The two main engines were converted from VASA type 46 D to type 50 DF. Westerman says: “Virtually everything was replaced except the crankshafts and frames.” The “Bit Viking” was then taken to Risavika/Stavanger for completion of the pipe installation, and testing and calibration of the newly installed equipment.

The vessel was then ready for its first bunkering of LNG. “The first time we prepared for bunkering we had to cool down the LNG storage tanks on the fore deck using liquid nitrogen at $-192\text{ }^{\circ}\text{C}$ ”, explains ▶

“Bit Viking”

Delivered in 2007 by China’s Shanghai Edwards shipyard, “Bit Viking” was built with double engine rooms, propellers, steering gears, rudders and control systems.

Having previously been powered by two 6-cylinder in-line Wärtsilä 46 engines running on heavy fuel oil, the conversion has changed these to 6-cylinder in-line Wärtsilä 50DF dual-fuel engines capable of operating on LNG supplied from two 500-cubic-metre LNG storage tanks on the fore deck.

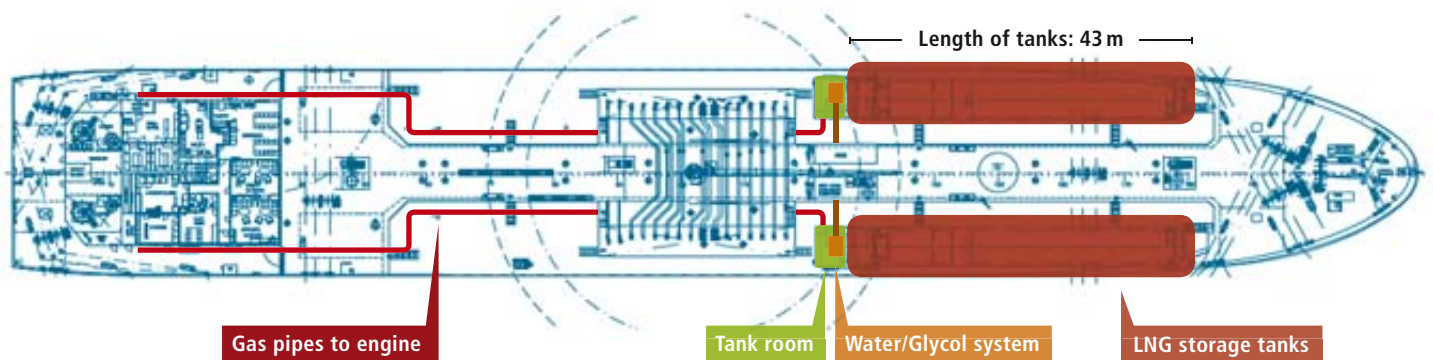
RETROFITTING. Work on the “Bit Viking” started at Landskrona shipyard, Sweden, in August 2011. Two months later the conversion to dual-fuel operation was completed in Risavika/Stavanger, where the piping was installed and the new equipment tested.



SEA TRIAL.

The converted “Bit Viking” can easily switch between oil and gas fuel.





OVERVIEW. Location of equipment on “Bit Viking”. The large LNG storage tanks are installed on the vessel’s fore deck. Each tank has a capacity of 500 m³.

► Westerman. The “Bit Viking” then successfully bunkered LNG, which has a temperature of $-162\text{ }^{\circ}\text{C}$, for a main engine test run at the pier. At the end of October, the “Bit Viking” was finally ready for its official sea trial. “She performed as expected and no major discrepancies were noted. GL had two surveyors on board during the sea trial.”

“The technical challenge in steering the conversion process was immense,” says Westerman. Key concerns in this world premiere were the proper interpretation of class rules

for safe construction, ensuring that the equipment manufacturers clearly understood the class rules, and anticipating how the flag administration would understand and accept the required risk analysis. “Particular focus was on bunkering and how it should be performed, since this is a somewhat critical operation that requires special knowledge and equipment.”

The conversion of the “Bit Viking” provided a good opportunity to put the GL rules for gas as ship fuel (see box) to



CONVERSION. From increasing the cylinder bore to 50 cm to installing a complete gas storage and delivery system, the project involved many steps. GL monitored the installation of the components.



SULPHUR.
Marpol Annex VI sets limits on sulphur emissions from ships. In Emission Control Areas (ECA), noxious emissions are to be cut to 0.1 per cent by 2015.

the test. Following the successful conversion, Westerman is optimistic: "The existing rules are sufficient for a conversion such as that of the 'Bit Viking'. However, some modifications will be made in the future as regulations such as Marpol are updated to reflect the option of gas as a ship fuel."

While the advantages of LNG-fuelled ship engines are well-known, there are a few performance drawbacks compared to fuel oil. Furthermore, the two 500-cubic-metre LNG tanks and the associated piping and valves add several hundred tonnes to the weight of the vessel. On the other hand, the ship enjoys increased buoyancy and lifting capacity. Westerman says: "You clearly win on the environmental side."

An LNG-powered vessel at this developmental stage is slightly more expensive than a conventionally powered equivalent, which increases capital cost. Yet with the advent of cash incentives for lower emissions in some Scandinavian countries, ship operators can also save money via rebates.

Where Scandinavia has taken the lead, others will follow. Under rules drawn up by the International Maritime Organization (IMO), vessels must cut SO_x emissions from 1 per cent today to 0.1 per cent by January 2015.

"Within the short period of operation since her conversion, the 'Bit Viking' has already achieved considerable benefits for the environment," says Westerman. "Greenhouse gases have been reduced by 20 to 25 per cent, NO_x gases by

90 per cent, sulphur output has been cut entirely, and particle emissions have been brought down by 99 per cent. An official emissions measurement has been conducted, but the final results have not yet been publicised. However, these estimates should be pretty close to the actual outcome."

Environmental Footprint

Naturally, the owner, Sweden's Tarbit Shipping, is very pleased with the environmental footprint of their newly converted vessel, and all project partners expressed their appreciation of the good spirit of cooperation. "We all held firm and stayed focused on the quality and safety outcome of the project," says Westerman. "It was the final result that counted. This was very important, since there is no room for errors in dealing with an LNG plant!"

The "Bit Viking" resumed commercial trading on 25 October 2011. Ever since, she has been performing as expected and the crew has successfully refuelled her from the shore-side facility at Risavika south of Stavanger. "Bit Viking" is now trading the extreme length of the Norwegian coast between Oslo and Kirkenes on behalf of oil major Statoil. ■ JG

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GL Guidelines for Gas as Ship Fuel

GL has prepared guidelines for gas as a ship fuel and supporting technical guidance on the application of the relevant IMO regulations.

Developed by the IMO Subcommittee on Bulk Liquid and Gases with GL assistance over the past few years, the interim guidelines are the first step towards the envisioned general code for gas as a ship fuel, the so-called IGF Code, which is currently under development by the IMO and is expected to enter

into force conjointly with the revision of SOLAS 2014. The GL guidelines will help shipowners and yards prepare for the introduction of gas as a ship fuel. The new guidelines provide criteria for the design arrangements and installation of propulsion and auxiliary machinery powered by natural gas to ensure a level of integrity, safety, reliability and dependability equivalent to that of comparable, state-of-the-art machinery burning conventional fuel oil.



LNG by Numbers

A raft of measures to reduce the shipping industry's impact on the environment are on the horizon. The required cuts in emissions to air have the experts pointing to LNG as the best solution for vessels to comply with the impending regulations – but what are the costs? GL expert Dr Pierre Sames about the factors influencing the decision to invest in LNG-fuelled vessels and the challenges facing the development of LNG infrastructure

NONSTOP: Dr Sames, what factors do shipowners need to consider when thinking about investing in a liquefied natural gas-fuelled vessel today?

SAMES: For a shipowner considering the installation an LNG system on a vessel, the first question is the price difference between LNG and heavy fuel oil. Provided that the price levels are more or less equal, it certainly makes commercial sense to opt for LNG. And the more time a ship spends inside of Emission Control Areas (ECAs), the faster the additional investment will pay off. The equation as such is quite simple, but market prices are rather intransparent. So the crucial question is: Can we identify reliable figures to base our decision on?



"BIT VIKING". The conversion to dual-fuel operation was completed recently.



LNG will be more economical than marine gas oil.

DR PIERRE C. SAMES
Senior Vice President,
Strategic Research and
Development at GL



NONSTOP: In the case of heavy fuel oil, the figures are relatively transparent. What leads to uncertainty in the LNG market?

SAMES: The absence of a global market for LNG makes it extremely difficult today to predict what the cost of LNG will be five years from now. This is further complicated by the marked difference in LNG prices between the US, Europe and Asia, which is much larger than that in heavy fuel oil prices. In the U.S., LNG currently costs one-fourth of what ship operators would have to pay in Asia.

However, we can predict with some certainty that LNG will be, and remain for the foreseeable future, more economical than marine gas oil (MGO), and this difference will

drive the return on investment in vessels operating in ECAs. However, the decision to adopt LNG rests primarily on the price difference between LNG and heavy fuel oil. And there are indications that ship operators may receive LNG at the price of heavy fuel oil in Europe today if they negotiate well.

NONSTOP: What are the average costs of investment and how can an owner accurately assess whether a decision to implement LNG on a vessel would make sense?

SAMES: GL has recently completed a new joint study with MAN that analyses the costs and benefits of LNG-powered container vessels. The results suggest an additional initial ►

► investment in the order of 300 to 500 dollars per kilowatt, taking all the LNG-related equipment into account. We also investigated the payback times for various configurations, ship sizes, routes, ECA exposures and fuel prices, and conducted extensive research to identify the dominant parameters for this calculation. The study shows that the price difference between heavy fuel oil and LNG and the amount of time a vessel operates in ECA zones are the most significant factors in determining the payback time for the investment in LNG before 2020.

NONSTOP: The establishment of more Emission Control Areas could then also act as a spur to LNG adoption?

SAMES: Indeed. We know, for example, that deep-sea vessels typically spend five to six per cent of their operating time in ECAs. But this figure could grow considerably on a number of shipping routes once the new requirements for ship fuel quality, which are equivalent to those in northern Europe, take effect along the North American coastlines in August 2012. In addition, a number of other sea areas are expected to introduce similar restrictions on emissions before 2020, the effective date of the global sulphur limits on heavy fuel oil. Again, it makes sense to look more closely at LNG for vessels operating more in Emission Control Areas.

NONSTOP: What other factors are relevant for the adoption of LNG as a ship fuel?

SAMES: There are many contributing factors, but one particular concern we considered in the joint MAN/GL study is investment costs and their dependence on the availability of refuelling stations. For example, a vessel operating on a typical deep-sea route between Asia and Europe would require a tank capable of holding enough fuel for one half of the ship's round trip. On a very large vessel this would be in the region of 10,000 cubic metres. However, a ship that can carry only enough fuel for half of its round trip would be more exposed to fluctuating fuel costs at its destinations.

On the other hand, limiting the tank size will directly affect the construction cost as LNG tanks are very expensive. It also means that less cargo space will be taken up by the tank, which increases the income potential of the vessel. As

more LNG fuelling stations are constructed in ports, the acceptance of this technology will benefit accordingly.

NONSTOP: There is increasing pressure on ports and ship operators to improve the turnaround time for bunkering. How are LNG-fuelled vessels affected by this?

SAMES: We are just beginning to delve into the question how much time it actually takes to bunker LNG safely. What we do know is that our customers will expect a similarly convenient bunkering process for LNG as for heavy fuel oil, including an acceptable time frame.

Today the process of preparing for LNG bunkering involves cooling down and inerting the systems and potentially the tank itself before beginning the actual refuelling process. But there are efforts underway to reduce the required preparation time. For example, it is possible to begin cooling down the hoses before making the actual connection. Similarly, the ship's crew could start cooling down the board-side system before connecting. There are a number of options we have not fully explored.

As commercial interest builds we will see the rapid development of new technology to facilitate LNG bunkering that is not established today. This is a technical challenge that can be overcome, and it is certainly one of the reasons why short-sea shipping is at the forefront of LNG adoption. You might say, it serves as an experimental laboratory for deep-sea vessels.

NONSTOP: How is access to LNG bunkering developing?

SAMES: A number of ports offer LNG facilities, particularly in northern Europe. In the spring of 2011, a new LNG terminal was commissioned by Linde at Nynäshamn, south of Stockholm, which will offer LNG ship refuelling very soon. Recently Gasnor announced they will make LNG available in the German port of Brunsbüttel. The company plans to supply the liquefied gas by truck initially, and possibly build a small terminal in the future provided that demand develops accordingly.

Such announcements from the supply industry are very helpful in encouraging shipowners to consider using LNG. It is important to demonstrate to owners that the supply side is



GREEN PORT. In October 2011, Brunsbüttel Ports GmbH, Germany, and Gasnor AS, Norway, signed an agreement that will enable vessels to bunker LNG in the port of Brunsbüttel. As an interim solution, the Norwegian company will supply the low-emission fuel by tank truck. A permanent fuel storage facility will be built at a later time. This landmark contract is essential for making LNG available to ships at the junction of the Elbe and the Kiel Canal.

willing to make a start and build up the required infrastructure as demand grows.

GL is currently working with the Hamburg Port Authority (HPA) to explore possible options for offering LNG ship fuel in Hamburg. In addition, GL is participating in an EU-funded project called “Clean North Sea Shipping”, and is planning to present an “LNG Showcase Hamburg” together with HPA at the European Maritime Day next May.

Several of our present R&D projects examine the practical and safety aspects of potential LNG bunkering facilities in Hamburg and other ports, with a focus on technical feasibility.

NONSTOP: Shipowners need supply options, suppliers need vessels to supply – this seems to be a bit of a chicken-and-egg dilemma.

SAMES: Yes, and this is one of the reasons why GL has taken such a strong stance in support of this technology. We believe we can be a driving force in this area, and have become involved in a number of activities, such as research, the development of rules and design concepts, and some initial commercial applications. Our contribution and support of the “Bit Viking” conversion project is a good example.

Without substantial expert support from classification societies such as GL, technologies such as LNG will not be developed, at least not at the speed we are presently seeing.

Photos: Brunsbüttel Ports GmbH



It is very satisfying for us to contribute to this development, to truly inspire people to use the available technology and to engage with us to implement it. I certainly hope the industry will eventually look back and say that moving in this direction was the right decision. ■ AM

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LNG in LPG Tanks – Taking a Closer Look

The demand for liquefied natural gas (LNG) as a clean-burning fuel has increased remarkably in recent years. A GL study investigates whether proven LPG tank designs could be reused for new small-scale LNG carrier ships



NORGAS INVENTION. GL-classed small-scale LNG carrier.

The traditional and most economical means of transporting LNG in bulk quantities over large distances is big LNG carriers. From LNG terminals in seaports, the liquefied gas is then distributed via pipeline networks to end consumers. As LNG moves into focus as a ship fuel and a cleaner energy source for shore-based customers, the existing LNG distribution and transport infrastructure need to be upgraded and adapted. In particular, there is a growing need for short-distance waterway transport of smaller quantities of LNG, and therefore a growing demand for smaller-sized LNG carriers. Understandably, shipowners have an interest

in reusing their proven designs for independent cargo tanks on board LPG carriers for the new small-scale LNG carriers they want to build.

Distribution of Temperature

LNG is transported at $-162\text{ }^{\circ}\text{C}$, LPG at $-104\text{ }^{\circ}\text{C}$. As a consequence, the steel structures supporting LNG tanks are exposed to much lower temperatures than those used for LPG tanks. Furthermore, the increased thermal contraction of the tanks subjects the tank support structures to higher stresses. Nevertheless, there may be ways to reuse proven LPG de-

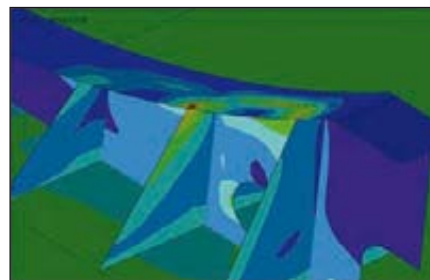
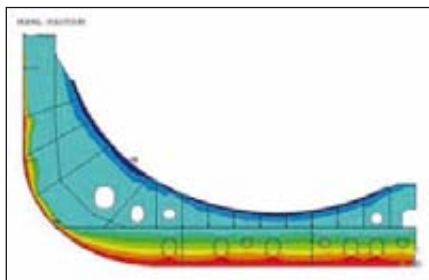
signs for LNG under certain circumstances. A detailed analysis should be performed to determine the temperature distribution in the tank supports and to verify fulfilment of the requirements of the IGC Code with respect to the selected steel grades and plate thicknesses. In a recent study, Germanischer Lloyd (GL) carried out such analyses for type-C bilobe tanks. Temperature distribution in the tank supports was determined for the tank filled with LNG vs. the same tank filled with LPG.

A 3-D model of the cargo hold, the tank itself including the insulation, the wooden bearing and the tank support structures was created, and the appropriate boundary conditions were applied (i.e. temperature of the tank contents, am-

low that determined for LPG. The lower temperatures of LNG affect the tank and its supports. To evaluate the stresses, the temperature field combined with the design loads as stipulated by the IGC Code were applied to the 3-D finite element model. When filled with LNG, the tank was shown to contract much more than with LPG. This means that the contact surfaces between the tank and its supports are smaller, and the resulting stresses greater. The more pronounced contraction in longitudinal direction aggravates the eccentricity of the wooden bearing on the sliding support, which further increases the stresses. In total, the investigation revealed a 35 per cent higher maximum stress for LNG than for LPG.

IGC CODE.
International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk.

LEFT. Temperature distribution at the fixed support for LNG (top) and LPG (bottom).



RIGHT. Von Mises stress distribution [MPa] at the sliding support for LNG (top) and LPG (bottom).

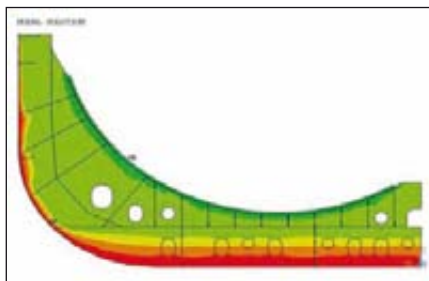


Photo: Hasenpusch

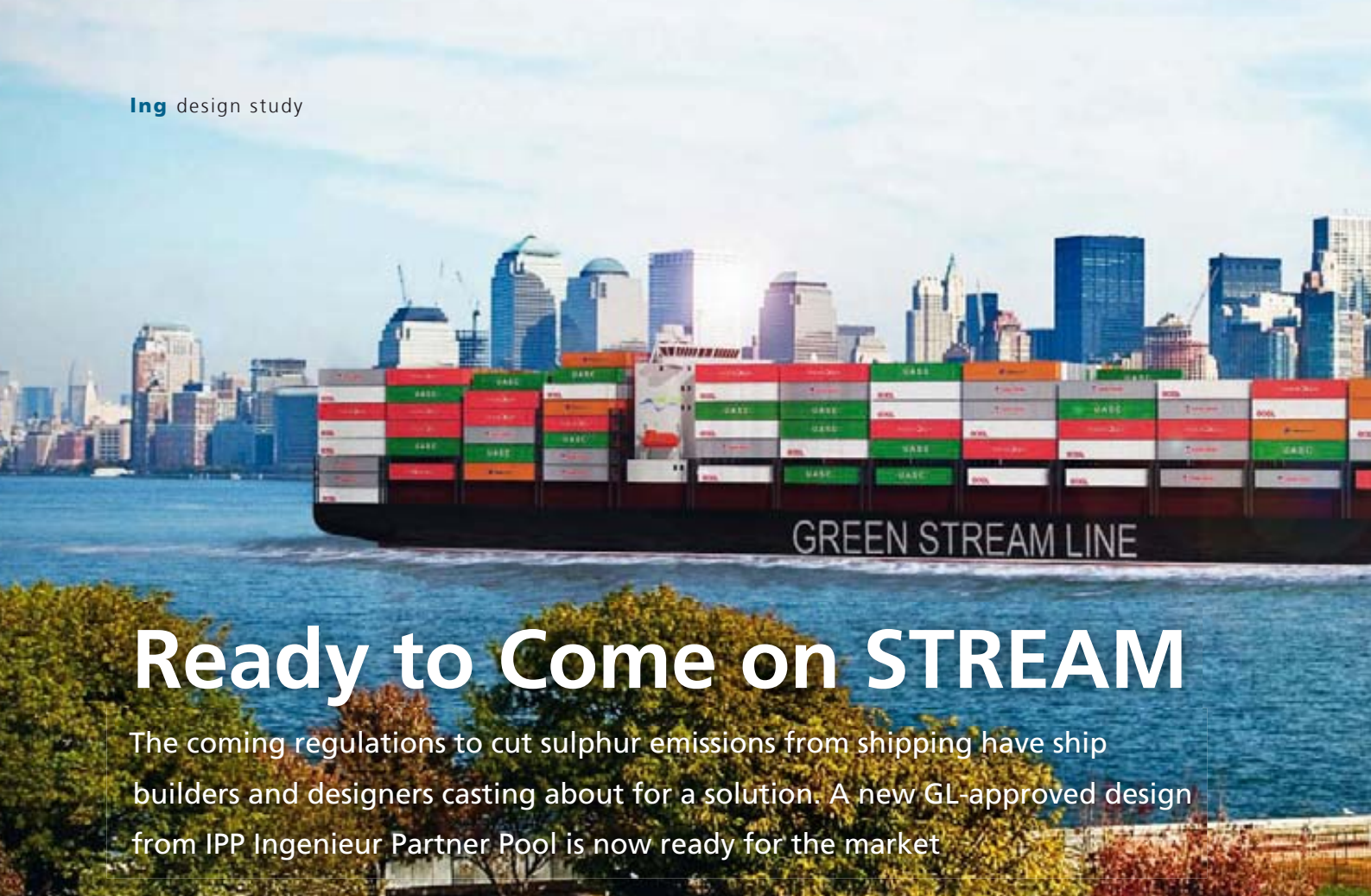
bient air and water temperatures). In addition, thermal conduction and convection had to be accounted. The prevailing temperatures inside the cargo hold as well as heat transfer coefficients had to be chosen carefully, since both parameters will influence the analysis results significantly. GL can draw on solid data for these important input parameters, obtained in long-term temperature measurements on tank supports and in cargo hold spaces of LPG and LNG vessels.

In the GL study, the temperature distribution in the fixed support structure of the LNG-filled tank showed a minimum temperature at the upper support flange of roughly 10 °C be-

The GL study demonstrates the need for detailed analyses of tanks and their support structures designed for new small-scale LNG carriers, even when adopting an existing LPG carrier design for LNG. Such detailed analyses should be performed by recognised experts to ensure appropriate approval in compliance with the requirements of the IGC Code. ■ **AB**

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Ready to Come on STREAM

The coming regulations to cut sulphur emissions from shipping have ship builders and designers casting about for a solution. A new GL-approved design from IPP Ingenieur Partner Pool is now ready for the market

Talking about the future of shipping, there is no way to get around LNG as ship fuel as the next big thing. After all, LNG-fuelled vessels promise a solution to many of the environmental challenges facing shipping over the next 30 years.

To meet the needs to cut CO₂ emissions and maximise efficiency wherever possible, German engineering company IPP Ingenieur Partner Pool developed the new containership design for LNG-powered containerships: STREAM. "With this design we are showing that it is no longer just a dream to build environment-friendly vessels for economic ship operation that fulfil government-defined green commitments," says Hans-Jürgen Voigt, Managing Director of IPP and TECHNOLOG.

The concept, which has been assessed by GL and given a certificate of approval, is for a range of liner or feeder vessels from 3,000 TEU to 4,200 TEU for worldwide service. From this range, TECHNOLOG as responsible marketing partner of IPP has presented an LNG-powered, fully cellular open-top container vessel – the STREAM 4200 LNG. Its 32.25-metre beam allows passage through the existing Panama Canal

locks. A draft of 10.50m to 12.00m means the vessel can operate worldwide, including the Kiel Canal (future dimensions) between the Baltic and North Sea. The vessel is subdivided into several double 40-foot holds. The forward hold is covered and designed to carry dangerous goods. The cargo holds behind this are of open-top design, including the hold behind the superstructure located semi-aft.

The forward mooring arrangement is fully sheltered by a large cover which forms an integrated part of the unique wave-breaking structure. The aft one is covered by the aft container stack. The layout can be configured to suit multiple shipping routes, with optimal flexibility as it is based on existing technology, says Mr Voigt.

Cargo Loading

"We have optimised the design of the vessel so it will be able to handle the full range of container sizes in use today," says Hans-Jürgen Voigt. Apart from this adaptability in sizing, the container stacks on the deck of the vessel are laid out to achieve higher stack weights and enable individual storage patterns and loading operations for each individual cell.

IPP. *The company was founded in 1999 to provide engineering services to the maritime industries, in particular initial and basic design, as well as general, comprehensive shop floor and manufacturing consulting services.*



FUTURE. STREAM vessel with a loading pattern suited to American trade route.

Illustrations: TECHNOLOG



Main Characteristics

Length over all	245.40 m
Length pp	233.50 m
Beam	32.25 m
Design draft	10.50 m
Full draft	12.00 m
Operation in LNG mode	9,000 nm
Operation in HFO mode	25,000 nm
Deadweight	49,000 t
Pay-Load range depending on route distances	39,500t – 43,000 t

Container Loading Capabilities

TEU above coaming	2,480
TEU below coaming	1,730
TEU total	4,210
Reefer above coaming	410
Reefer below coaming	650
Reefer in total	1,060
maximal 40' ISO total	2,070
maximal 45' HQ	920
maximal 48' DOMCON	450
maximal 49' DOMCON	400

All of the 40ft container slots in the hold as well as three tiers of the deck slots have been fitted for reefer containers. "We have specially developed the ventilation systems to suit these reefer slots," Mr Voigt continues. The cargo storage and lashing equipment as well as the stack-splitting system have been custom-designed in cooperation with the international cargo and load handling specialist CARGOTEC. STREAM ships can also be fitted with electrically-operated deck cranes at outfitting or at a later time if required.

Bunkering System

The LNG fuel systems for the STREAM were developed jointly with TGE Marine Gas Engineering and include a fixed bunker tank inside the vessel and a novel portable deck-mounted LNG tank system which can be used to provide extra capacity. For bunkering, the fuel containers will be connected to a newly developed docking station. GL's Deputy Head of Environmental Research Department, Dr Gerd Würsig elaborates: "One of the most important factors in the development of new LNG-fuelled vessels is the bunkering system. The fuel storage and bunkering systems must be safe and reliable,

ensuring that there is no gas spillage. But as we can see in the STREAM, these systems are beginning to come on line."

"In the shipping climate we are facing today, we have to consider not only efficiency, although that was our top priority with the STREAM, but also crew safety," says TECHNOLOG's Hans-Jürgen Voigt. "The threat of piracy is something that has to be taken into account by every responsible ship designer. Systems to assure the safety of the ship's crew need to be considered at the design stage." Passages below deck run the length of the entire vessel, providing access to the cargo and machinery spaces and the crew's quarters. Armoured shutter plates can be closed in the central entrance lobby to cut off the interior of the vessel, including the deck house, from the deck.

The entire vessel design concept is focused around saving energy. A single screw is directly driven by a dual-fuel, ►



TECHNOLOG.

The company was founded in 1979 for technical sales and trading as well as technology transfer. In 2008, Technolog Services was established for dedicated support of the maritime industry.

▶ two-stroke, 22.9 MW engine developed specifically for LNG applications by MAN. The same dual-fuel system is used for the auxiliary power generators and boilers. Exhaust gas boilers and waste heat recovery equipment are installed.

Beyond merely saving fuel, the efficiency of the propulsion system means that a STREAM ship can operate in a wide variety of ways. When loaded to medium draft, the main engine can provide all of the vessel's required electric and propulsive power. When needed, the auxiliary engines can generate additional power for added speed or to boost power in poor weather conditions. As a whole, the design and operational features result in significant lower fuel consumption compared to any designs running on standard fuel.

With some extra initial investment, the vessel can take advantage of a waste heat recovery system (WHRS) for even greater fuel efficiency. An exhaust gas boiler system can be installed that feeds an MAN Diesel & Turbo turbo generator set for electric power generation. An optional, "minimum-fuel-controlled" power management system from Siemens can reduce fuel consumption further, thereby cutting overall energy costs. Estimates suggest that the slightly higher initial costs of installing such a system will pay off in approximately

four to six years depending on ECA zone application and fuel price development.

Hull Optimisation Solutions

A new fuel solution is only one aspect of the drive to greater efficiency in shipping today. Designers are continually searching for ways to improve the efficiency of vessels, using CFD (computational fluid dynamics) to generate hull forms with improved hydrodynamic properties.

The hull lines of the STREAM have been optimised by HSVA (Hamburgische Schiffbau-Versuchsanstalt) experts and the application of tools, methods and expertise from GL's FutureShip unit to minimise fuel consumption as well as resistance in water and air while maximising cargo capacity and ensuring maximum stability. With the support from FutureShip, the designers were able to model a large number of design variants, select the traits desired, and then modify the best variants to arrive at an optimal hull form.

Improved hull lines allow installation of a highly efficient, relatively slow-running propeller from project partner MMG (Mecklenburger Metallguss GmbH). A Becker Marine rudder ensures maximum manoeuvrability.



Illustrations: TECHNOLOG

DRAFT. STREAM vessel with a typical European loading pattern.



GL Class Notation for the STREAM

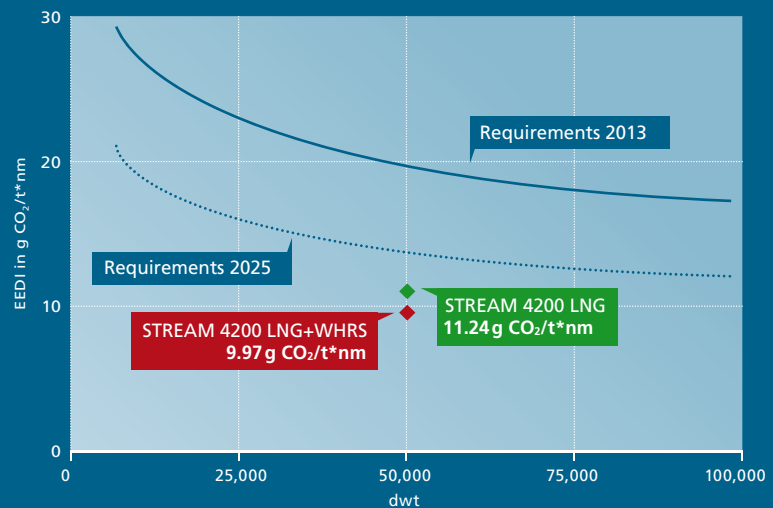
※ 100 A5 CONTAINER SHIP, HATCHCOVERLESS

DG, IW, ERS, HLP, BWM, NAV-OC

※ MC, AUT, RCPx/y, GF, EP

DG	Dangerous Goods
IW	In Water Survey
ERS	Emergency Response Service
HLP	Hull Lifecycle Program
BWM	Ballast Water Management
NAV-OC	Bridge Design One-Man Control Console – Ocean and Coastal Waters
AUT	Unattended Machinery Space
RCP	Refrigerated Cargo Protection in Reefer Container
GF	Gas as Fuel
EP	Environmental Passport

EEDI Calculations



Upcoming regulations will require extra investment to meet stricter emission requirements, even for ships running in dual-fuel mode, to meet strict sulphur, carbon dioxide and nitrogen limits for ECA zones and harbour areas.

Future-Proofed

As currently configured, the STREAM already meets all of the upcoming regulations to control air emissions from shipping. In addition, STREAM ships boast an EEDI, based on preliminary calculations, that is significantly beneath the required baseline for 2025. Hans-Jürgen Voigt, Managing Director

of TECHNOLOG, is convinced: "Looking ahead to 2020, our projections suggest that when we compare the operation of the STREAM against a conventional vessel in an emissions control area (ECA), we arrive at a conservative estimate of fuel cost savings in the region of 30 per cent." ■ SA

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Shipowners Must Stay Sensible

Even in these troubled times, Briese Shipping, one of the largest German shipping companies, trusts in a young fleet, high safety standards and state-of-the-art equipment. The company's founder and CEO, Prof. Roelf Briese, speaks about the looming crisis and new options in the offshore sector

NONSTOP: You established Briese Shipping in the early 1980s. Looking back now, were those the "good old days"?

ROELF BRIESE: Well, back then the cargo markets were still in a healthy state. The interest in limited liability capital was growing, so it was easy to find partners for the construction of ships. So our launch was quite successful.

Only a few years later, the position turned out to be more difficult.

If you ordered ships in 1986/87, you tended to encounter problems with the financing. However, the shipyards were still doing relatively well, so that they were able to offer bridging loans and other assistance. Since then, everything has developed very well for us.



DIVERSITY.

The Briese fleet includes 120 multi-purpose and heavy-lift cargo carriers, such as the “BBC Leer” with 20,567 dwt.

Photo: Briese Shipping

NONSTOP: What is the secret of your success?

BRIESE: We always bought a lot of ships, but then sold them again at the right time. As a result, we have a modern, economical, ecological and sophisticated fleet that operates predominantly in the multi-purpose and heavy-lift business. In this area, the technical demands are considerably higher. The strength and stability of these vessels must be calculated very precisely. The effort in respect of the logistic procedures is much greater than with container ships, for instance. An example here is the newbuilding of the “BBC Fuji”. For this project, we worked closely with GL. One of the challenges was that the bridge visibility was initially



Photo: Geoff Garfield

MOVER. Naval architect and captain Roelf Briese founded Briese Shipping in Leer back in 1984.

inadequate – but we were able to solve the problem by using cameras. To increase the stability, we ourselves developed movable tween-deck pontoons that will be used for all our ships. The requirements set by GL for the dimensional accuracy and fit were very high.

NONSTOP: In economically difficult times, it is good to be broadly positioned. How has your company prepared itself for the looming crisis in shipping?

BRIESE: Our portfolio strategy is such that we intend to move away from the role of being just a carrier and towards being an integrated logistics enterprise. This also means that ▶



Photos: Briese Shipping

EXPERTISE. Briese manages project cargoes in a demanding environment.

► we will offer stevedoring and ship design services as well and, moreover that we have our own crewing agencies and can also carry out ship repairs and take care of minor problems. Our objective is to be as independent as possible of the so-called global carriers. Accordingly, we have set up our own charter company called BBC, a wholly-owned subsidiary currently managing 140 ships and represented worldwide with 24 branches. This offers certain advantages, especially in times of crisis. During the good years, we built up the corresponding logistics. The end result is that we always have cargo to carry – even if this is sometimes at a low level. But we still have something to “chew on”. Naturally, we are also under some pressure, but no BBC ship has had to be laid up yet.

NONSTOP: How are you approaching the coming year?

BRIESE: A little more optimistically than only a short while ago. This is mainly connected with a visit to the USA and South America. The investment volume and demand for transport is increasing there, whilst the excessive overcapacities in the European and Asian markets are leading to low freight yields. As is well known, many shipowners who ordered containerships have cancelled their tonnage and have gone on to build large numbers of heavy-lifters and multi-purpose vessels. This growth must first be absorbed. At present, the level of newbuilding activity in this segment is relatively low. It is to be hoped that the shipowners – including Briese – all remain sensible and do not build too much new tonnage.

About Briese Shipping

Established in 1984 in Leer, in the north-western part of Germany near the border with the Netherlands, Briese currently operates 127 vessels. To date, more than 200 ships have been built by this enterprising firm.

Key interests include project cargoes of all shapes and sizes through the use of specially designed multi-purpose vessels with heavy-lift derricks (load capacity of up to 700 tonnes) and ice class (1A, E3). All ships under management are certified by Germanischer Lloyd in accordance with the ISM Code. For eleven years now, the company has also fulfilled the requirements of DIN EN ISO 9001:2000 – also certified by GL.

Besides the shipping company and BBC Chartering & Logistic GmbH & Co. KG, the Briese Group also has its own port logistics and crewing agencies. In addition, Briese carries out ship design and offers consultancy and engineering services. Worldwide, the Group has more than 2,000 employees.

NONSTOP: In view of these developments, would you advise young people to seek employment in the maritime sector?

BRIESE: Yes, absolutely. The conditions in the maritime sector have improved greatly over the years. If you spend three months at sea nowadays, you get more than 46 days of paid vacation. Good opportunities are certainly to be had. And if you go to sea for five or six years, the probability of getting a good shore position is high.

NONSTOP: Are you noticing a lack of skilled staff?

BRIESE: More so in the ship operating technology sector than in the nautical area. The applicants often have a lack of corresponding qualifications, especially with regard to ship operating technology. Acting jointly with the Ems-Achse shipping association, we therefore decided in 2005 to provide ten-year funding for three endowed professorships and one lecturing position at the nautical college here in Leer. We collected three million euros of donations to support this programme. The end result: in the last semester, we had 400 students reading Nautical Science and Ship Operation and Ship Management, giving us reason to believe that more new blood will be entering the job market here.



MISSION CONTROL. Briese headquarters in the East Frisian city of Leer.



We need secure funding for the offshore business.

ROELF BRIESE
CEO Briese Shipping



CHALLENGE. Heavy lifting by the "BBC Baltic".

OWT. In 2001, Briese initiated the establishment of Offshore Wind Technologie GmbH (OWT) for the design and production of offshore wind turbine foundations.

NONSTOP: New talent flowing in – also for the classification societies. Where do you see the tasks of a modern classification society?

BRIESE: The main assignment, I think, is in the co-development of optimised ships: that is, the building of vessels that are both economical and ecological at costs that are as low as possible. On the other hand, I feel the class should get together with the shipping companies to consider how the availability of ships can be maintained in a meaningful way or adapted to match demand. Every call in port and every docking event costs a lot of money. In the decisions made by a classification society, I would like to see a clear policy. It is vital that the relevant expertise is applied in a joint dialogue and that the options are considered by specialists from all angles.

NONSTOP: New horizons for development are being offered by the offshore sector. You have specialised in the transportation of wind turbines and, through the company Offshore Wind Technologie GmbH (OWT), are also involved in the planning and construction of offshore wind farms.

BRIESE: One thing is clear: the energy turnaround can no longer be reversed. Consequently, there is a very large demand in the offshore sector, but the level of caution is likewise high. These investments often involve million-euro figures, and the attendant risk is not always foreseeable. For all that, our offshore business has got off to a good start. Es-

tablished by us, OWT designs and develops foundations for offshore wind turbines. The production of these components is planned to take place in Emden, Papenburg and further locations along the Ems river, amongst other sites. The transportation and installation of the foundations will then be handled by Briese Shipping, for example. We are already participating in several projects but, to be able to award larger and more costly contracts, we need greater security and reliability of the funding.

NONSTOP: Now that piracy has become a massive problem, safety on board is playing an ever more important role. One of your own ships was also affected. What do you expect in this regard from governments and international shipping bodies?

BRIESE: The international community of states is under an obligation to make sure that the world's oceans are safe. We have conducted a number of discussions, also in Berlin with representatives of the various ministries. Unfortunately, no progress has been made at all. There was lots of talking, but no specific action was taken in the end.

And yet Germany is not alone with the "all talk, no walk" syndrome. My view is, therefore, that the international community must do much more. According to the number of registered ships per owner, Germany is only in third place. Here I see a need for action from the Greeks and the Japanese, too. ■ **AM**

GL Academy – Dates at a Glance

Selected seminars in 2012 – information and registration: www.gl-academy.com

JANUARY

16. – 20.01.12
Curso de Superintendente
Veracruz, Mexico

17.01.12
Ship Structural Design
Singapore

18. – 20.01.12
Train the Trainer for Shipping Companies
Genoa, Italy

23. – 24.01.12
Company/Ship Security Officer (CSO/SSO) Training Course
Copenhagen, Denmark

24.01.12
Crew Safety
Madrid, Spain

25.01.12
Maintenance of Life-Saving Appliances and Fire-Fighting Equipment on Board Seagoing Ships
Madrid, Spain

25. – 26.01.12
Internal Auditor ISM/ISPS for Shipping Companies
Copenhagen, Denmark

26.01.12
The SOLAS Convention
Piraeus, Greece

26. – 27.01.12
Vetting Inspections
Rome, Italy

FEBRUARY

01.02.12
STCW Basics
Singapore

02.02.12
STCW 2010 Implementation Workshop
Singapore

02. – 03.02.12
Internal Auditor ISM/ISO 9001:2008 for Shipping Companies
Copenhagen, Denmark

07. – 08.02.12
IAMSAR – On Scene Coordinator Training
Madrid, Spain

07. – 08.02.12
Internal Auditor ISM/ISPS for Shipping Companies
Piraeus, Greece

14. – 15.02.12
Internal Auditor ISM/ISPS for Shipping Companies
Singapore

14. – 15.02.12
ISM – A Risk Management Approach
Copenhagen, Denmark

16. – 17.02.12
Management Representative ISO 9001:2008
Singapore

20. – 21.02.12
Designated Person Ashore (DPA) Training Course
Singapore

22.02.12
Ship–Shore Communication
Singapore

27. – 28.02.12
Implementation Workshop ILO Maritime Labour Convention
Singapore

29.02.12
Damages to the Hull Structure
Singapore

MARCH

01.03.12
STCW 2010 Implementation Workshop
Piraeus, Greece

02. – 03.03.12
Internal Auditor ISM/ISPS for Shipping Companies
City of Makati, Philippines

02.03.12
BSC – Balanced Score Card – Planejamento Estratégico para

Área da Saúde
São Paulo, Brazil

05. – 09.03.12
Superintendent Training Course
Gdańsk, Poland

06. – 07.03.12
Implementation Workshop ILO Maritime Labour Convention
Copenhagen, Denmark

06. – 09.03.12
Approved HazMat Expert
Singapore

08. – 09.03.12
Designated Person Ashore (DPA) Training Course
Naples, Italy

11. – 15.03.12
Environmental Management Systems Auditor/Lead Auditor Training Course
Dubai, United Arab Emirates

13. – 14.03.12
IAMSAR – On Scene Coordinator
Limassol, Cyprus

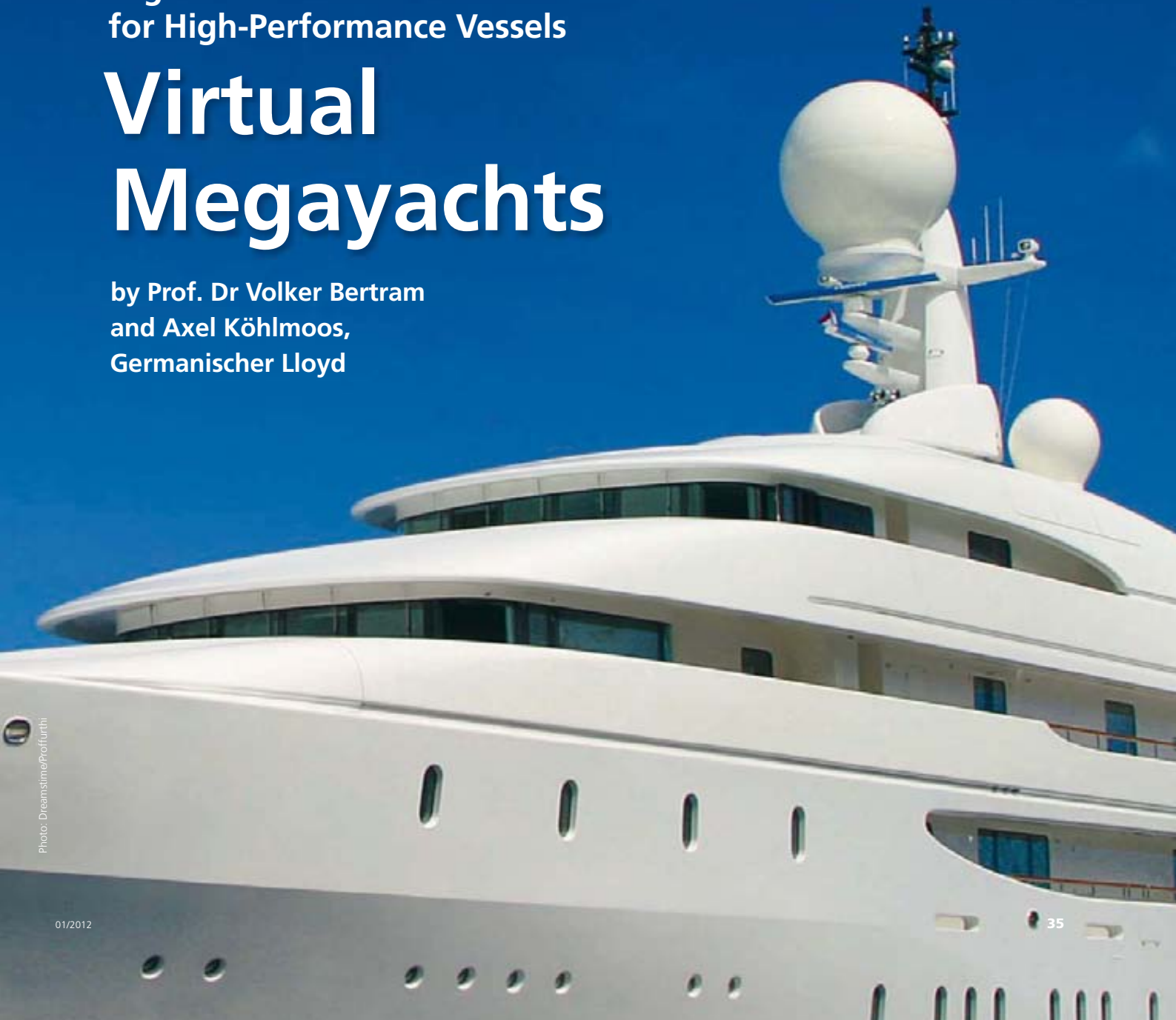
28.03.12
Latest Amendments to Maritime Regulations
Istanbul, Turkey



High-Performance Simulations
for High-Performance Vessels

Virtual Megayachts

by Prof. Dr Volker Bertram
and Axel Köhlmoos,
Germanischer Lloyd



EXHAUST GAS.
CFD simulation of
smoke dispersion.



Introduction

Ship design has always been primarily an experience-based skill. While this is still true to some extent today, we increasingly rely on “virtual experience” drawn from computer simulation. The rapid development of fast and unconventional ships since the 1980s would have been impossible without advanced simulation technology. Simulation is especially crucial in megayacht design where innovative and unusual concepts requested by customers often involve additional risks. Megayachts have grown beyond 200 metres in length; this is just one example of how designers push the limits. Whenever we leave the “comfort zone” of our experience and venture into new designs, simulations ensure that these designs are efficient and not only viable, but also safe.

Simulation has become a powerful tool to support better business processes within the megayacht industry by:

- ensuring comfort;
- increasing freedom of design;
- achieving better designs in less time and
- enabling fast and efficient trouble-shooting.

Ensuring Comfort

Comfort, a key requirement for a megayacht, comprises many aspects. The most important ones are discussed below from an engineer’s perspective.

Seakeeping is vital for passenger comfort. For many seakeeping issues, linear analyses (assuming small wave height)

provide a fast method to investigate numerous parameters (wave length, wave direction, ship speed, etc.). Studying extreme motion patterns, particularly those involving slamming, usually requires non-linear computational fluid dynamics (CFD) simulations, which place high demands on computer resources and are limited to relatively short time periods (seconds to minutes). Combining intelligently linear frequency-domain methods with non-linear time-domain simulations takes advantage of the strengths of both approaches. This detailed analyses enables designs with considerably improved seakeeping behaviour and passenger comfort.

Aerodynamics affect noise and smoke propagation as well as local flow conditions on helicopter decks, sunbathing decks and similar locations. While wind tunnel tests are still widely used, CFD offers the advantage of overcoming scale effects, which can be significant when thermodynamic processes are involved. CFD can be combined with formal optimisation, e.g. to minimise smoke dispersion on decks.

Ventilation system designs are usually based on simple estimates, which often result in over-dimensioned and energy-inefficient systems and sometimes poor performance. CFD, on the other hand, delivers detailed insight, leading the way to a smarter layout.

Noise and vibration limits are standard elements of building specifications for megayachts. High comfort expectations must be accounted for during the initial design stages. The simulation tools to support low-noise design are currently



"TÛRANOR PLANETSOLAR". The obtainable speed in waves was predicted at the conceptual design stage.

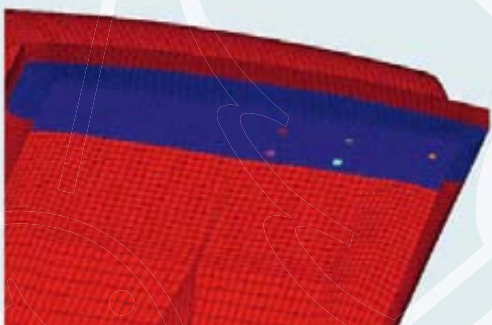
being expanded to also include underwater noise, an aspect receiving growing attention in the megayacht industry.

Increasing Freedom of Design

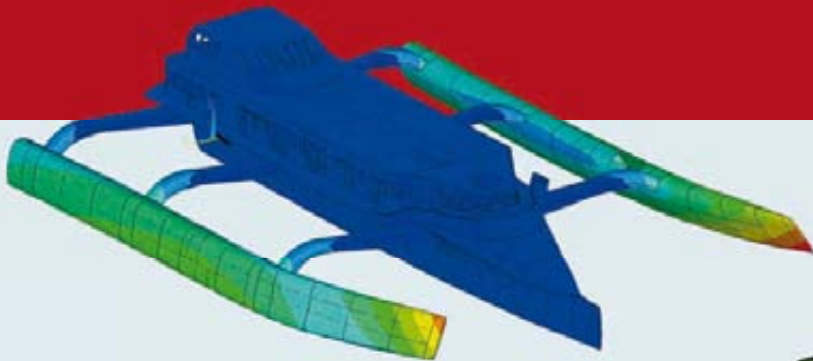
Several projects illustrate how advanced simulation-based design methods increase the freedom of design for shipyards and owners. The lightweight design of the record-breaking trimaran "Earthrace" was only made possible by using sophisticated CFD simulations for the load and subsequent finite-element analyses of the composite hull structure. In another pioneering project, the solar catamaran "Tûranor PlanetSolar", the obtainable speed in waves – crucial for the

first circumnavigation of the world by a solar-powered vessel – was predicted as early as during the conceptual design stage. Yet another example is the largest megayacht of its time, which set new standards in terms of size and speed. In all these cases, highly innovative designs were implemented based on high-performance simulations of both hydrodynamic and structural behaviour.

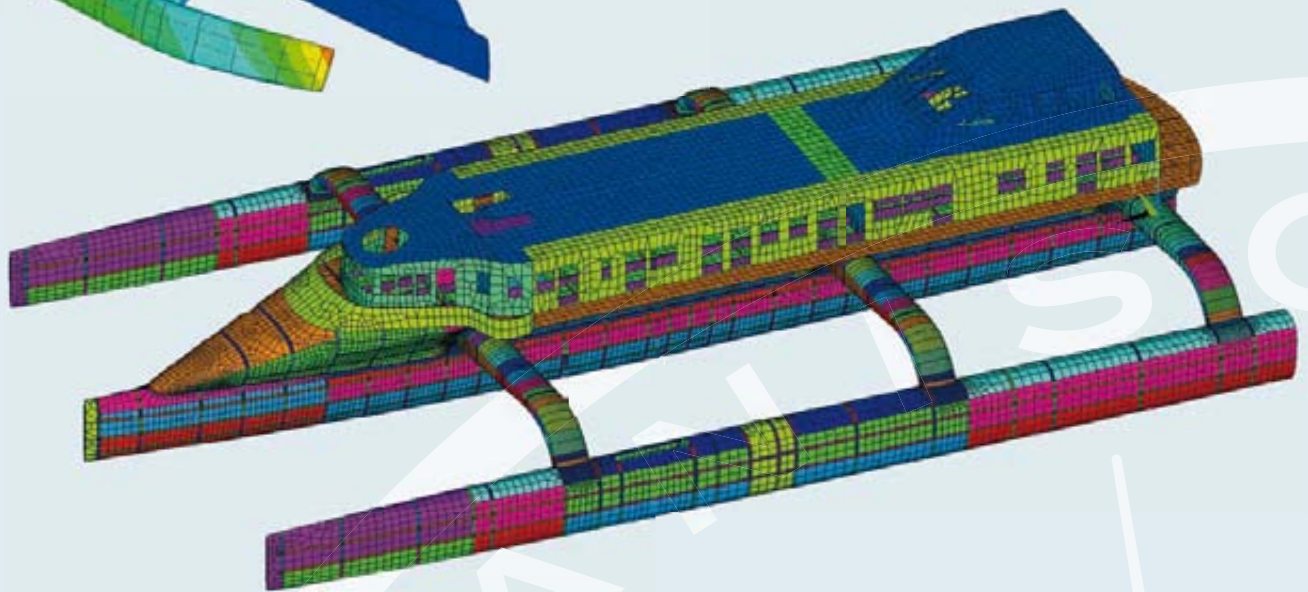
Composite materials are increasingly used in high-performance vessels, including megayachts. It is the combination of low weight, high strength and mouldability that makes these materials attractive for designers. The choices in designing a particular component to suit its purpose are often only limited by the development budget or the ▶



STERN OF A MEGAYACHT. Original design (left) and modified design for reduced slamming impact (right); slamming pressures were reduced by almost 30 per cent.



COMPOSITES. Structural analyses of trimaran "LAMU III".



► designer's creative imagination. Classical, "by-the-book" approaches to structural design do not work for high-performance, light-weight concepts. Prescriptive rules are often too inflexible, especially for advanced composite elements. In addition, it is necessary today to give due attention to the recycling properties of composite materials, besides their strength aspects.

Achieving Better Designs in Less Time

Using CFD simulation to develop the hull lines of high-performance yachts has been standard procedure for years. Formal optimisation, however, is a relatively new field of application. CFD simulation may improve the required power (and associated weight). Alternatively, the gain in efficiency may be used to increase the speed of the boat at the given installed power. Optimisation requires considerable com-

puter resources due to the complex flow patterns and the enormous number of design alternatives to be investigated. However, in our experience the effort is justified by the good results obtained, and CFD simulation is quickly becoming a standard tool in high-performance yacht design.

Simulations are similarly useful when designing propellers, water jets, rudders and other appendages. On fast ships especially, these components are frequently affected by cavitation issues. Unfortunately, problems often remain undetected until the ship undergoes sea trials or has been in operation for some time. Even then, simulation can guide efficient troubleshooting and redesign, but avoiding cavitation-related problems in the first place by performing appropriate checks during the design stage is clearly preferable. Traditionally, naval architects have resorted to standard baseline designs, statistical regression models and systematic series data as a basis for their design. Most of these data series,



however, are hopelessly outdated. Today, the FRIENDSHIP-Framework software offers an environment for compiling custom data series for numerical simulation.

To develop a parametric design, a family of design variants can be created by systematically modifying the parameters. The key benefit of this method is that it allows the designer to build a knowledge base ahead of an anticipated project. Once this has been done, the designer can quickly extract data from the numerical model series during the conceptual design stage.

Enabling Fast and Efficient Trouble-Shooting

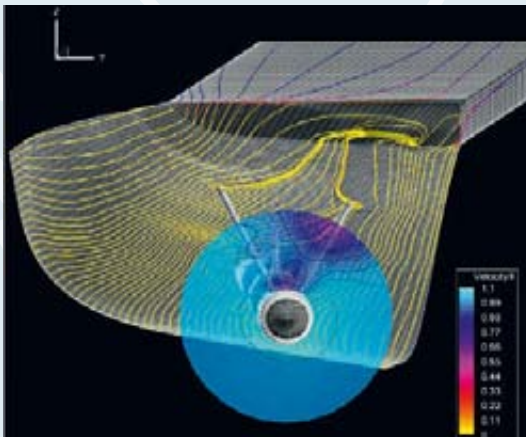
The first indication of a design problem, such as noise or vibration, is often encountered during sea trials. In some cases, however, it can take months or even years of operation, or a rare off-design situation, for a design flaw to become appar-

ent (e.g. fatigue cracks or cavitation erosion on rudders). In some cases, the diagnosis of the problem is straight-forward, in others a more extensive analysis is required to pinpoint the root cause of a problem. Once this is known, redesigning the affected structure or operational procedure is comparatively easy. Simulation techniques are employed in both the diagnosis of the problem and the effective assessment of the redesign options. Vibration, including vortex-induced vibration, is an area where simulation has advanced our processes considerably.

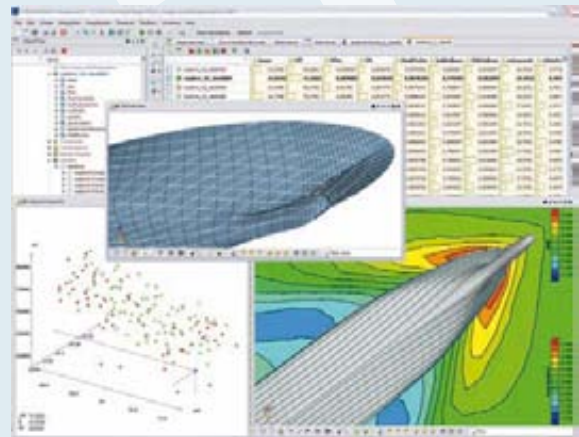
Highly Skilled Experts Make the Difference

Time and time again our advanced design projects have shown that simulation, when used skilfully, saves time and money. Ideally, the parties involved should agree on the scope and procedure for simulations at the earliest time possible. ▶

FLOW.
Simulation
for a fast
twin-screw
vessel.

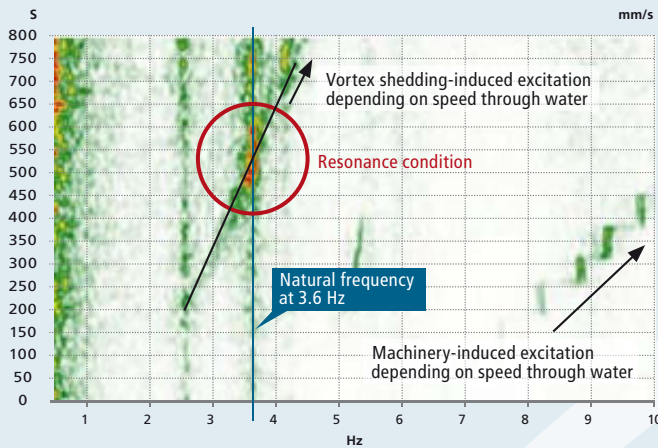


**FRIENDSHIP
FRAMEWORK.**
Tailored
design series for
megayachts.

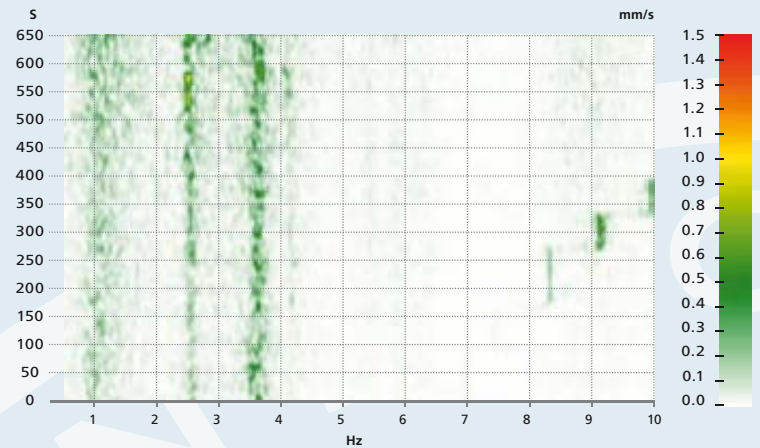




Vibration Level in Owner's Cabin



Vibration Level in Owner's Cabin – After Modification



► Unless the shipowner (as the main benefactor) specifically asks for simulations for design optimisation in his project specifications, time and budget constraints will often prevent them from being carried out. Furthermore, the mere use of advanced simulation software does not guarantee that true optimisation will be achieved. More than ever

before, engineering involves the art of modelling and finding the right balance between the level of detail and the available resources (time, manpower). This requires significant experience. The true value offered by engineering services thus lies not in software licenses or hardware but in highly skilled staff putting these resources to best use.

Bibliography

Bertram, V.; Brehm, A.; Köhlmoos, A. (2011), *Smoke assessment for megayachts*, Via Mare XI/1, pp. 49–51

Bertram, V.; Gualeni, P. (2011), *An overview of seakeeping tools for maritime applications*, IMAM 2011 Conf., Genoa

Bertram, V.; Hoffmeister, H.; Müller, S.; Moltschanivskyj, A. (2010), *Technological challenges for construction and classification "Türanor PlanetSolar"*, 7th Int. Conf. on High-Performance Marine Vehicles (HIPER), Melbourne, pp. 76–85

Brehm, A.; Bertram, V.; El Moctar, O. (2011), *CFD guided improvement of a cavitation-prone rudder*, 14th Numerical Towing Tank Symp. (NuTTS), Poole

Couser, P.; Harries, S.; Tillig, F. (2011), *Numerical hull series for calm water and sea-keeping*, 10th Int. Conf. Computer and IT Applications in the Maritime Industries (COMPIT), Berlin, pp. 206–220

El Moctar, O.M. (2007), *How to avoid or minimize rudder cavitation*, 10th Numerical Towing Tank Symp. (NuTTS), Hamburg

El Moctar, O.M.; Bertram, V. (2002), *Computation of viscous flow around fast ship superstructures*, 24th Symp. Naval Hydrodyn., Fukuoka

Fach, K. (2006), *Advanced simulation in the work of a modern classification society*, 5th Int. Conf. Computer and IT Applications in the Maritime Industries (COMPIT), Oegstgeest, pp. 34–44

Fach, K.; Bertram, V. (2006), *High-performance simulations for high-performance ships*, 5th Int. Conf. High-Performance Marine Vehicles (HIPER), Launceston, pp. 455–465

Fach, K.; Bertram, V. (2009), *Advanced simulations as design decision support*, 10th Int. Marine Design Conf., Trondheim

Gramann, H.; Krapp, R.; Bertram, V. (2008), *Disposal and recycling of HSC materials*, 6th Int. Conf. High-Performance Marine Vehicles (HIPER), Naples, pp. 271–280

Harries, S. (2010), *Investigating multi-dimensional design spaces using first principle methods*, 7th Int. Conf. on High-Performance Marine Vehicles (HIPER), Melbourne, pp. 179–194

Harries, S.; Vesting, F. (2010), *Aerodynamic optimization of superstructures and components*, 9th Int. Conf. Computer and IT Applications in the Maritime Industries (COMPIT), Gubbio, pp. 335–347

Kaufmann, J.; Köhlmoos, A.; Bertram, V. (2010), *CFD guided hydrodynamic design of a rigid-inflatable boat*, Via Mare X, August

Köhlmoos, A.; Bertram, V. (2009), *Vibration analysis for a mega yacht*, RINA Conf. Design, Construction & Operation of Super & Mega Yachts, Genoa

Menzel, W.; El Moctar, O. M.; Mumm, H. (2008), *Advanced thinking on tricky excitations*, The Naval Architect, March, pp. 64–69

Oossanen, P. van; Heimann, J.; Henrichs, J.; Hochkirch, K. (2009), *Motor yacht hull form design for the displacement to semi-displacement speed range*, 10th Int. Conf. Fast Sea Transportation (FAST), Athens

Ziegler, W.; Fach, K.; Hoffmeister, H.; El Moctar, O. M.; Bethane, P. (2006), *Advanced analyses for the EARTHTRACE project*, 5th Conf. High-Performance Marine Vehicles (HIPER), Launceston, pp. 101–108



Photo: Caterpillar Marine Power Systems

Improving Satisfaction

A new contract with Caterpillar represents an important milestone for GL's Marine Service Assessment services

Caterpillar Marine Power Systems (CMPS) has contracted Germanischer Lloyd to provide Marine Service Assessment (MSA) services to its worldwide marine dealer network. The network consists of independent companies offering sales services, commercial and technical support, as well as maintenance and repair of marine diesel engines and generator sets. Caterpillar will use GL's MSA certification as a basis for standardising Caterpillar dealer after-sales performance and quality worldwide in an effort to improve end-user satisfaction. In view of Caterpillar's worldwide relevance and volume, this MSA certification contract represents an important milestone for GL's certification services.

The MSA process will enable Caterpillar to assess and set annual product-support-related goals for their dealers. The need to standardise the service capabilities of its regional dealers on a global basis has a high priority on Caterpillar's agenda. "We selected GL for this important programme because of the organisation's worldwide network of skilled auditors and in-depth experience in second- and third-party audits and the global recognition of GL within the marine industry," says P. Jaime Tetrault, Product Support Director of Caterpillar Marine Power Systems.

GL will conduct the MSA certification using standardised audit methods, i.e. audits performed according to its own ship classification rules. Following a successful Marine Service Assessment by GL, dealers will be given a GL certificate as independent evidence of compliance with the global standard.

The independent assessment of the technical and commercial performance of the worldwide dealer network is to

set a benchmark for Caterpillar's services centres and to establish a common standard of evaluation. Another objective of the certification programme is to help identify areas for improvement in the scope of dealer services, including functions such as technical support, main shop repairs, field repairs, upgrades, parts sales, qualification of technical staff, back-up support, administration, disposition, customer satisfaction, and service and parts delivery time. ■ OM

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BUSINESS PARTNERS. (f.l.t.r.) Thomas Minks (GL), Vitaly Preobrazhensky (CMPS), Jaime Tetrault (CMPS), Nigel Parkinson (Managing Director, CMPS), Erik van der Noordaa (CEO, GL) and Peter Leveringhaus (GL).

COMPANY PROFILE.

For more than 85 years, Caterpillar Inc. has been making sustainable progress possible and driving positive change on every continent. With sales and revenues of 42.588 billion US dollars in 2010, Caterpillar is the world's leading manufacturer of construction and mining equipment, diesel and natural gas engines, industrial gas turbines and diesel-electric locomotives.

One-Stop Service for

In September, GL Systems Certification celebrated the handing-over of the ISM/ISPS audit certificates for their 5,000th ship, “MV Kota Berkat” – an important milestone for GL’s newly integrated certification services business

In early 2010, the decision was made at GL to merge the industrial and maritime certification businesses. Oliver Darley, Vice President GL Systems Certification, explains the benefit of this change: “Until recently we had two different departments in charge of standards: the ‘Fleet in Service’ organisational unit was handling maritime standards while Industrial Services was in charge of all other standards, such as ISO 9001 and 18001. However, many of our customers request certification to a combination of standards, such as ISM plus ISPS plus ISO 9001 plus ISO 14001. In the past they had to work with at least two different contacts here at GL. Now we are able to offer true one-stop shopping. Customers can be offered any combination of maritime and non-maritime standards via one single point of contact.”

To supplement these services, the GL Academy offers safety, security and quality management training courses through its offices located at all major ports around the world. Shipowners and operators can request not only a combination of certification services but also packages comprising certification offerings plus appropriate training. Packaged services may also include consultancy. “Through GL’s subsidiary FutureShip, we can also provide our clients with access to our own safety and quality management consultancy expertise,” notes Mr Darley.

Asian Markets, a New Focus

GL has been active in safety management systems certification from the very beginning. Olaf Quas, Global Head of

Systems Certification

Maritime Management Systems (ISM/ISPS MLC 2006) at GL, recalls: "We were among the leading certification bodies under the ISMA Code, the predecessor of the ISM Code; and we were a founding member of ISMA, developing the code in Cyprus jointly with ship managers and certification bodies." Upon the introduction of the ISM Code in 1994, the team began to grow from its origins as a small "task force" into a full-service department. The introduction of the ISPS Code in 2003 prompted a significant expansion of the team to help customers deal with the newly introduced regulations.

Apex Ship Management, the Singaporean operator of "Kota Berkat", represents a new generation of customers coming to GL for ISM/ISPS certification, Mr Quas explains: "Apex have taken over quite a number of GL-classed vessels recently. We are looking forward to expanding our certification activities with ship management companies in Asia as they are becoming more aware of GL."

Mr Darley agrees that these new markets offer great potential for GL as companies begin to understand the benefits of GL's integrated certification services: "Any time ▶



HANDING-OVER. (f.l.t.r.) Capt Thet Oo Maung (Apex Ship Management), Capt G.R. Prathap (Maritime Port Authority of Singapore), Capt Philip Tay (Apex Ship Management), Capt Senczuk Krzysztof Zbigniew (Captain "MV Kota Berkat"), Y. C. Lam and Maslyn Choo (both Germanischer Lloyd).



INTERVIEW.
Oliver Darley (r.),
Vice President
GL Systems
Certification, and
Olaf Quas, Global
Head of Maritime
Management
Systems at GL.

▶ someone requests an audit, the inquiry will trigger an automatic sequence of events allowing us to respond rapidly. Our excellent geographic coverage allows us to dispatch the appropriate auditors at short notice.”

What concerns many clients at the moment is how they can benefit from the ISM Code while implementing the MLC, 2006. “There is definitely a link between the two when it comes to successful practical implementation,” says Mr Quas. One area where these codes interact is risk assessment. Risk assessment was incorporated into the ISM Code in 2010 as an amendment, but without much indication of how it was to be implemented. Mr Quas explains: “We realised that risk management was actually nothing new. We already had the

requirement to identify of risks as part of safety management. But what turned out to be new from the amendment to the ISM Code was the assessment of risks and a way to deal with this in a systematic manner.”

Guideline for Clients and Auditors

Port State Control over the past year has been very focused on making systemic and documented risk assessments a priority. This focus, however, did not filter down to owners and operators. GL responded by developing a guideline for clients and auditors to help them better understand what the ISM Code requires in terms of systematic assessment of risks.

“One way we do this,” Mr Quas explains, “is that auditors place the necessary emphasis on this topic while performing an audit, not only to verify compliance with the new requirement, but provide added value to the customer at the same time. When you carry out a risk assessment systematically, you are actually beginning to develop a continuous improvement process, identifying weaknesses and developing corrective action to prevent recurrence.” By demonstrating compliance with the assessment of risks, customers are also enabled to prepare effectively for the implementation of the MLC 2006, which includes risk evaluation, in terms of occupational health and safety, as a firm requirement.

The perfect way to prepare for future MLC shipboard inspections is to have the relevant personnel participate in an appropriate training programme provided by the GL Academy. “Our most frequently requested seminar is a two-day

ISM CODE

The purpose of the International Safety Management Code (ISM Code) is to ensure safety and prevent loss of life and damage to property and the environment.

The ISM Code requires ships to implement a Safety Management System (SMS), which is then audited, first internally by the company itself, then by the vessel’s Flag State Administration or its Recognised Organisation. Once the external audit of the SMS has been completed successfully, the vessel is issued a Safety Management Certificate.

ISPS CODE

The International Ship and Port Facility Security Code (ISPS Code), developed in the wake of the 9/11 attacks, came into force in 2004.

The code provides a framework for ensuring the security of ships and port facilities by evaluating risks and implementing appropriate security measures. Under the code, vessels are required to have a Ship Security Officer as well as a Ship Security Plan (SSP) in place. Once the SSP is approved by the Flag Administration or its Recognized Organization and the external audit on the ship has been completed successfully, the International Ship Security Certificate is issued to the ship.



workshop where we actually develop implementation solutions jointly with shipping company employees, such as drafting the procedural documentation,” says Mr Quas. This workshop is primarily geared towards crewing and human resources staff who are in charge of implementing MLC 2006, helping them to develop answers to key questions and solutions for the requirements of the convention. The programme also reaches out to the top executive level, offering a briefing by MLC experts to clarify the responsibilities of senior management once the convention comes into force.

ISMA CODE.
International Ship Management Association Code of Ship Management Standards.

New E-Learning Tool Available

As part of GL's packaged services helping customers get ready for the implementation of the MLC, the certification team has developed a practical tool for those at the hard end of implementation – the seafarers. A DVD e-learning tool for the MLC 2006 is now available. A recently published pocket guide completes the service tools. Both are intended for use by on-board personnel, giving them a general idea of the requirements of the MLC 2006 and showing them how to prepare for an inspection. They clearly and concisely explain what expectations auditors will have, what questions they will be asking, and how the crew can demonstrate com-

CD. GL has developed a comprehensive MLC 2006 e-learning tool.

pliance with the requirements. Olaf Quas explains: “Crews do not have easy access to training seminars. That is why these tools, while also useful for shore-based personnel, were mainly developed for seafarers, explaining the main topics of the MLC 2006 in few words.”

Full-Service Package

The purpose of our integrated certification services is to make the convenience of one-stop shopping a reality for customers, says Mr Darley. The GL Systems Certification team is making every effort to give the best possible support to clients across the organisation, from the on-board crews to the top executives. Mr Darley sums it up: “We want to address the needs of everyone who has any influence on management system implementation within an organisation. We deliver the whole package.” ■ SA

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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 > Rules & Guidelines

I – Ship Technology

Part 2 – Inland Navigation Vessels

Chapter 1

Classification and Surveys 2011-11-01

Chapter 2

Hull Design and Construction 2011-11-01

Chapter 3

Machinery, Systems and Electricity 2011-11-01

Chapter 4

Additional Requirements for Notations 2011-11-01

Part 6 – Offshore Service Vessels

Chapter 1

Hull Structures 2011-12-15

Chapter 2

Machinery and Systems 2011-12-15

IV – Industrial Services

Part 6 – Offshore Technology

Chapter 9

Guideline for Personnel Transfers by Means of Lifting Appliances 2011-11-01

VI – Additional Rules and Guidelines

Part 11 – Other Operations and Systems

Chapter 4

Chamber Systems for Tunnelling 2011-12-01

Dates at a Glance

For further dates and additional information, see www.gl-group.com/events

January

14. – 16.01.2012

Int. Conf. Submarine Robotics

Chennai, India

31.01. – 02.02.2012

Pacific 2012 International

Maritime Conference

Sydney, Australia

February

23.01. – 23.02.2012

German Ship Finance Forum –

Marine Money

Hamburg, Germany

28.02.2012

5th Ann. Hong Kong Ship Finance Forum

Hong Kong, China

28. – 29.02.2012

Raising Ship Efficiency Summit

Hong Kong, China

28.02. – 01.03.2012

Vietship

Hanoi, Vietnam

March

12. – 14.03.2012

HPYD

Auckland, New Zealand

14. – 16.03.2012

Asia Pacific Maritime

Singapore

19. – 21.03.2012

CMA/Shipping 2012

Stamford, USA

26. – 27.03.2012

European Bunker Fuel Conference

Amsterdam, Netherlands

27. – 29.03.2012

Green Ship Technology

Copenhagen, Denmark

April

16. – 18.04.2012

COMPIT

Liège, Belgium

18. – 20.04.2012

Sea Japan

Tokyo, Japan

25. – 27.04.2012

Seatrade Offshore

Marine Asia

Singapore

25. – 27.04.2012

ShipPax 2012

Stockholm, Sweden

Imprint

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