

Germanischer Lloyd

EDITION 2 · 2007

nonstop

The Magazine for Customers and Business Partners

LNG Tanker

Brimming With Energy

AIDA *Her Excellency Certified*

Interview *EU Commissioner Dimas*

Pipelines *Audit in the Andes*



First Class tankers: a new perspective



Tankers are like a work of art – the more quality they offer, the more valuable they are. Welcome to GL, your First Class partner in improving the operational safety and profitability of your tankers!

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Germanischer Lloyd
OPERATING 24 / 7

Dear Readers,

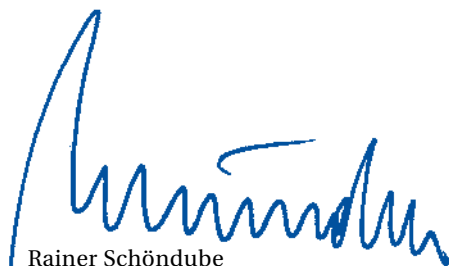
In 140 years' time, there will be no more oil or gas tankers, because the era of fossil fuels will have ended. For Germanischer Lloyd as a forward-looking classification society, now is already the right time to think about the future of ship propulsion. What alternatives will be available when crude oil runs short and becomes too valuable to burn?

Our anniversary this year – Germanischer Lloyd turned 140 years old on 16 March – prompted us to examine the future more closely. “Technical horizons and the sea” is the book title of our attempt to plot the global developments up to the year 2147. At the same time, the title outlines the agenda for our future activities: through technical innovation, we wish to make a substantial contribution not only towards increasing the profitability of shipping today but also for the energy supply of the coming decades.

Maritime Services and Industrial Services – with these two business areas, we are already well positioned today to face the challenges of tomorrow. Synergies result not only with the topic of energy supply. In the years to come, we intend to expand our expertise as an independent authority on safety, quality and environmental protection. We wish to advise our customers on how ships can be built ecologically and operated economically, what possibilities there are for reducing ship emissions, and how the operational safety and reliability of production facilities, pipelines and wind turbines can be improved further.

The fact that everyone is talking about maritime environmental protection is not only due to the UN report on climate change but also to the EU Commission's Green Paper on Maritime Policy. We asked Stavros Dimas, EU Commissioner for the Environment, about the ecological perspectives for the decades facing us. One of the political demands concerns clean energy for shipping: distilled fuels or gas. With the increasing transportation of liquefied natural gas in tankers, their propulsion concepts are also being called into question. Here we give you a comprehensive overview of the pros and cons for the various options. After all, the future has its roots in the present.

Yours sincerely,



Rainer Schöndube
Member of the Executive Board
Germanischer Lloyd



Rainer Schöndube

contents



14

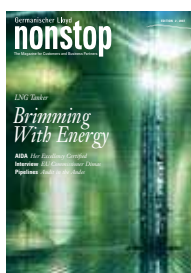


30

Foto: AIDA Cruises

COVER STORY: LNG TANKERS

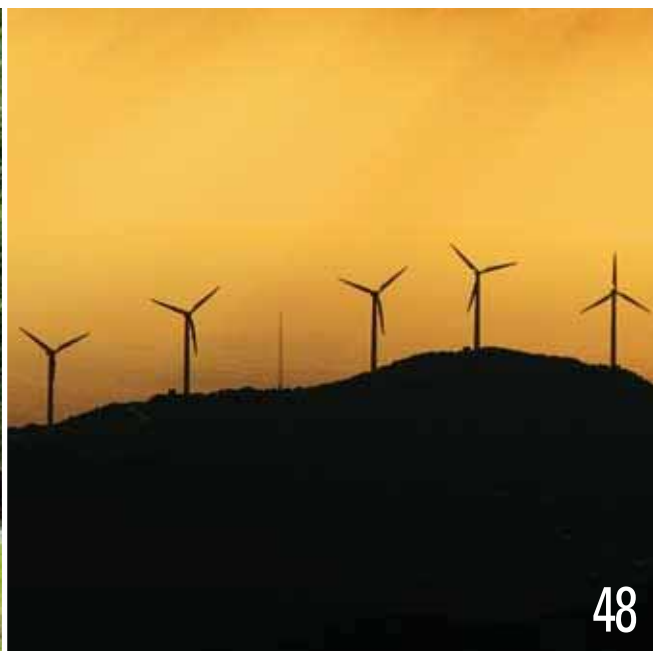
- 14 **LNG Market:** Energy out of a Double Bag
Transporting of LNG by sea is booming –
the demand for modern tankers as well
- 15 **Cross-section:** Membrane or Ball-shaped
The intelligent interiority of LNG tankers
- 20 **Costa Azul:** Sealifting Energy
A gigantic receiving terminal in Baja
California will supply consumers with gas
- 23 **Engines:** Propulsion Alternatives
Next-generation LNG tankers demand more
advanced technologies – an overview



Title picture: interior
view onto a membrane
tank of an LNG tanker
of the Spanish Navantia
shipyard.

MARITIME SERVICES

- 8 **News**
- 26 **Interview:** “A Question of Responsibility”
Stavros Dimas, EU Commissioner for
Environment spoke about maritime policy
- 30 **AIDA:** Her Excellency of the Seas
The new cruise ship sets new
standards – certified by Germanischer Lloyd
- 32 **Finland:** AILA – Class 1 A Super
Shipowner Lanch Ship is giving the
Finnish Register of Ships fresh impetus
- 34 **Anniversary:** Forward through Rough Sea
140 years of Germanischer Lloyd, Part 2
(1889 to 1945)
- 38 **Training:** Virtual Emergency
In a new simulation centre shipmasters
and officers prepare for emergencies



INDUSTRIAL SERVICES

- 43 **News**
- 45 **Malaysia:** It All Began with Gas Cylinders
20 years of GLO in the East Asian country
– a success story
- 46 **Pipelines:** Audit in the Andes
Detecting leaks at an altitude of 4,800 metres
– a great challenge for GL experts in Peru
- 48 **Spain:** In Touch with the Wind
The prospects for alternative
energy sources in Spain are glorious

STANDARDS

- 6 **Perspectives:** On-site in Valparaiso
Accompanying a GL surveyor on board
- 41 **Service:** Trade Fairs, Conferences,
GL Academy, New Addresses and Positions
- 42 **Imprint**
- 50 **Insight:** The New GL-Class
TOCA makes it easier to change class

On-site in Valparaíso



Ernesto Mueller is a Hull and Machinery Surveyor with Germanischer Lloyd in Chile. From the GL office in Viña del Mar, 15 minutes from the port of Valparaíso, he and his auditor colleagues inspect shipowners and shipyards in South America. In early 2007, Mueller took *nonstop* along for an inspection of the “Cap Nelson”, a containership owned by shipping company Hamburg Süd.

nonstop: Mr Mueller, you are about to pay a visit to the “Cap Nelson”. What exactly are you going to inspect there?

Ernesto Mueller: The “Cap Nelson” is due for its annual class and safety audits. We will check the ship itself and its machinery, as well as the fire extinguishing system, the lifeboats and other equipment.

nonstop: How would you describe the tasks and responsibilities of an auditor?

Mueller: An auditor’s responsibility is to classify ships and offshore equipment, conduct approval tests and perform routine technical audits. This includes inspecting newbuildings, material and components, as well as preparing damage analyses.

nonstop: A ship has to undergo a number of different inspections during its operating life. How frequently do you inspect a particular ship to ensure it is ready for operation?

Mueller: A ship has to be inspected thoroughly every five years. Within that time span, there are additional routine inspections of parts such as the hull, the machine and the superstructure. To make it easier for GL clients to remember upcoming inspections, Germanischer Lloyd has simplified its fleet management. With the fleet online tool, clients can check online at any time what inspections are pending for any specific ship of their fleet.

Photo: Sabine Weimro



news

GALA IN ATHENS

Shipowners Meet Ship Financing Experts

The setting was festive, the discussion attention-grabbing: How does the financing model of a German limited partnership work? What opportunities does it offer on the international market? And how could Greek shipowners benefit from this system? Invited by Germanischer Lloyd, representatives of over 50 Greek shipowners and ten major ship financing institutions had gathered to examine this question. They all agreed: this gala event was a first-rate platform for getting acquainted and initiating the dialogue.

Dr Hermann J. Klein, Member of the Executive Board of Germanischer Lloyd,

opened the evening, highlighting the successful history of both the German KGs and the Greek shipping industry. German issuing houses provided the shipping industry with almost 3 billion euros of equity capital in 2006. Greek shipping companies spent 25 US\$ billion dollars last year on the purchase of ships. In addition to these record investments, the two groups also share a strong interest in the Asian market, Dr Klein explained.

Direct Support. Germanischer Lloyd has around 500 experts in China and throughout South East Asia, thus being able to provide direct support and ex-

pertise on a local level to all those concerned. The honourable speaker, Dr Wolfgang Schultheiss, German ambassador in Athens, emphasized the long tradition of Greek shipping. In the area of financing, however, there is still room for improvement for Greek shipowners and German issuing houses to work together.

After all, the KG model has become accepted worldwide. Particularly with respect to the increasing interest in the tanker market on the German side and the corresponding Greek expertise in this area, Dr Schultheiss feels that working together would be beneficial for both sides.

Roger Hönig, auditor and tax adviser at TPW Todt und Partner KG, explained the details of KG financing and the ways in which it is especially well-suited to investors who would like to commit to a limited period of time in order to minimize risk. A central topic of discussion among those in attendance was the extent to which these opportunities would be of interest to the strongly traditional and family-oriented Greek shipping industry.

MEETING. German ambassador Dr Wolfgang Schultheiss (2nd from r.) with Athanasios Reisopoulos, Dr Hermann J. Klein and Torsten Schramm (all GL, l. to r.) at the gala in Athens.



BIELESCHWEIG WORKSHOP

System Safety on the Agenda

More than 30 national and international representatives of the automotive, aerospace, maritime, railway and medical systems industries and of the academic world met at the Germanischer Lloyd head office in mid May to discuss systems engineering. The topics of the 9th Bieleeschweig Workshops were "Model-based System Development" and "Incident Analysis".

The Bieleeschweig workshops originated in December 2002 as a joint initiative of the German universities of Bielefeld and Braunschweig. Highly regarded internationally, they also serve as the main platform of the Ger-

man chapter of the System Safety Society (www.system-safety.org).

Dr Karsten Loer of GL's Strategic Research and Development department is a founding member of this chapter, as well as chapter president-elect to take office in July 2007. Presentations from previous workshops are available on the workshop websites: www.rvs.uni-bielefeld.de/Bieleeschweig/

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Photo: Corbis

VISIONS. German chancellor Dr Angela Merkel, President of the European Commission José Manuel Barroso (2nd from l.), Transportation Minister Wolfgang Tiefensee (r.) and the host of the Green Book conference, Bremen's governing mayor Jens Böhrnsen.

EUROPEAN MARITIME POLICY

Doubtful Future for Heavy Fuel Oil

Maritime environment protection was on the agenda of the European Conference on the Green Book on maritime policy held in Bremen, Germany, in early May. The two-day conference, titled "Future Maritime Policy in the EU: European Vision for Oceans and Seas", was opened by German chancellor Dr Angela Merkel. "Areas such as fishing, shipping, protection of the seas, offshore energy and coastal development, traditionally viewed as separate issues, must be addressed in context," Dr Merkel emphasized.

Reducing Emissions. Referring to the far-reaching decisions of the EU Council of Ministers, she said: "Following expiration of the Kyoto Protocol as an international framework in 2012, we want to be a driving force be-

hind climate protection by reducing our CO₂ emissions by 20 per cent by the year 2020."

Chancellor Merkel left it to her Minister of Transportation to raise specific demands for the shipping industry. "We need quality standards for ship fuels, similar to the standards we have had for land-based transportation for a long time," said Wolfgang Tiefensee, calling for heavy oil to be abandoned worldwide in favour of diesel. In support of the EU Commission's proposal to extend the emissions trading scheme to shipping, he stated: "Ships are environment-friendly." Maritime shipping accounts for no more than two percent of worldwide CO₂ greenhouse gas emissions, he added.

The EU Commission intends to present specific plans in September for implementing emissions trading in the shipping sector as of 2012. A first step towards reducing sulphur emissions had already been taken by declaring the Baltic Sea a sulphur emission control area with substantially lower sulphur limits. As of 11 August 2007, the same low-sulphur ship fuel requirements will apply to the North Sea, as well.

Tailor-made Solution. Germanischer Lloyd offers shipowners the preparation of a ship-specific "Fuel Change-over Manual" (FCOM) providing a detailed description of the change-over procedure (see also page 12). This will help deliver proof of proper fuel change-overs to port state authorities while avoiding technical complications when switching lubricants.

HUDONG-ZHONGHUA SHIPBUILDING

China's Container Giant

It was a smooth ceremony: China just launched its largest container ship to date, the "Xin Ya Zhou". The 8530 TEU vessel, built by Hudong-Zhonghua shipyards for the China Shipping Container Line (CSCL), is 334 m long, 42.8 m wide and has a 14.65 m draught. Its keel was laid in November 2006. The ship is scheduled for delivery on 30 September 2007. The newbuilt vessel will be classed by both Germanischer Lloyd and the China Classification Society. Four additional ships of the same series will be classed with GL only.

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THE LAUNCH. Container giant Xin Ya Zhou at Hudong-Zhonghua Shipbuilding.

POLISH COMMITTEE

New Perspectives for Shipyards

Restructuring, possible caps for production output: Polish shipyards and their future were the centre of discussion at the meeting of the 12th Polish Committee of Germanischer Lloyd in May. The participants listened carefully as the top management of Stocznia Gdansk S.A. delivered a detailed report on the current situation.

Famous Shipyard. The history of Stocznia Gdansk began as early as 1844 with the establishment of Krolewskie Zaklady Budowy Korwet. After the liberation of Gdansk at the end of World War II, the new Polish government merged the shipyard and next-door neighbour Schichau Werft, forming Stocznia Gdanska, none less than the famous Lenin Shipyard where the Solidarnosc trade union was born.

The company was privatized in the early 1990s and became a joint stock company. It was purchased by Stocznia Gdynia S.A. in 1998. In 2006, it once again became a separate entity. As part of the country's industri-

al development agency ARP which owns Stocznia Szczecinska Nowa, it is now part of Korporacja Polskie Stocznie, the Polish shipyard cooperative within ARP.

The future of Gdansk Shipyard depends on its ability to reposition itself by building an independent corporate identity within the shipping world as a builder of container vessels, reefers, ro-ro and passenger ships as well as multipurpose ships. Stocznia Gdansk employs some 3,000 staff. The shipyard has three slipways, the largest one capable of accommodating vessels up to 265 m in length and 33.8 m in width.

Broad Range. The discussion confirmed the importance of Poland's shipbuilding industry as a traditional cornerstone of the country's economy and a major contribu-



OVERVIEW. Remontowa shipyard in Gdansk.

tor to export sales. The agenda of the meeting covered a broad range of topics such as market studies for particular ship types; the impact of common structural rules (CSR) on the design of new tankers and bulk carriers; procedures for clarifying technical questions related to CSR within IACS; or the impact of the new IMO protective coating requirements on workmanship.

CHEMICAL RECOVERY

Swedish Coast Guard Ready for KBV 003

Keeping the Swedish coastline tidy is a lot of work: emergency towing, fire fighting, oil/chemical response including lightering and oil/chemical spill recovery, rescue operations, sea surveillance or fishery control. All of these will be handled by the new multi-purpose vessel KBV 003 which will be commissioned by the Swedish coast guard in early 2010.

Equipped with an advanced chemical recovery mode, KBV 003 will be ready for emergency towing, fire fighting and rescue operations in a chemically contaminated environment. Built by the Damen shipyard in Romania, it will be 82 m long and carry oil recovery tanks with a total capacity of 1000 m³, including two special chemical tank/hold combinations

of 90 m³ each. It will be classified by Germanischer Lloyd. With more than 22 marine pollution response vessels such as "Arkona" and "Neuwerk" under regular survey, Germanischer Lloyd is the only classification society that has defined specific rules for this technically challenging ship type. The vessel will be delivered in November 2009.

Increasing Demand. GL is constantly expanding its service network for shipyards, the supply industry and shipping companies in Scandinavia. Currently, Germanischer Lloyd is represented in the Swedish cities of Stockholm/Akersberga, Gothenburg and Karlstad, as well as in Turku and Helsinki in Finland, in Oslo, Alesund and Bergen in Norway, in Copenhagen, Alborg, Arhus and Fredericia in Denmark and in the Icelandic capital of Reykjavik. The country office for Sweden and the area office for Scandinavia are both located in Stockholm.

For further information: Rainer Gutzmer, Area Manager Sweden, Phone: +46 8 54410341, E-Mail: rainer.gutzmer@gl-group.com



MISSION. The Swedish coast guard ordered a new multipurpose vessel.

Photo: Swedish Coast Guard



MEETING. The participants of the 12th China Committee.

CHINA COMMITTEE

By the Rivers of Xishuangbanna

The ambience was inspiring, the results were encouraging: Xishuangbanna was the location where the Germanischer Lloyd China Committee met in April for its 12th session. The autonomous prefecture in Southern Yunnan Province in the People's Republic of China straddles the Lancang (Mekong) river – often called “Danube of the East” because of its great economic importance for southern China. Xishuangbanna is the home of the Dai people and twelve other tribes. Because of its tropical climate and beautiful nature, the region is quickly becoming a tourist destination. But the par-

ticipants of the Committee Meeting had come for more than a day off in the wild elephant valley. The representatives of shipowners, shipyards and the supply industry discussed new bulk carrier designs, latest regulations affecting containership design and advanced tools for optimizing the design process.

For further information: Dr Volkmar Wasmansdorff, Director, Head of Division East Asia, Phone: +86 21 614 167 17, E-Mail: volkmar.wasmansdorff@gl-group.com



ARTIC SEA. Increasing risks of oil spills.

Photo: Fabio Cavazzini

ARCTIC SHIPPING

Scenario Oil Spills: Combating in Ice

As the world's easily accessible oil deposits dwindle, offshore oil exploration advances into more remote areas. As a consequence, shipping activities in ice-covered waters have increased considerably – as has the risk of oil spills.

At this year's Arctic Shipping Conference in St Petersburg, Russia, Seppo Liukkonen, Germanischer Lloyd's Station Manager Helsinki, discussed current methods of combating oil spills in the arctic. “Recovering oil spills in ice poses several challenges,” said Liukkonen. “Mechanical recovery methods are preferable from an environmental point of view.”

But there are disadvantages as well: They are labour-intensive, costly and not

very effective. Treating an oil spill chemically by spraying dispersants across the affected area is easier logistically but does not actually remove the oil from the sea. The oil slick is broken up into small droplets that are then diluted with seawater.

The most effective method would be “in-situ burning”. It is feasible even in harsh ice conditions, but it has its limitations: enormous heat and the risk of spreading fire. Liukkonen's conclusion: There is no universal panacea for combating oil spills in ice-covered areas just yet.

For further information: Seppo Liukkonen, Deputy Country Manager Finland, Phone: +358 96850750, E-Mail: seppo.liukkonen@gl-group.com

LEADERSHIP CHANGE

Torsten Schramm Named COO

In mid-April, Torsten Schramm, Division Manager for Europe, Middle East and Africa, was appointed Chief Operating Officer of Germanischer Lloyd. Schramm (46), a chief engineer with extensive experience, joined Germanischer Lloyd in 1989. In 1996 he was posted to Japan for three years as Principal Surveyor and Area Manager, followed by a two-year assignment in

China. In 2001 he returned to the head office as Area Manager for Germany. Just two years later Schramm was promoted to Division Manager for Central Europe. In conjunction with organizational changes, the regional scope of this responsibilities was extended to include the Middle East and Africa. He has been acting as Senior Principal Surveyor since November 2005.



TORSTEN SCHRAMM. He has been with Germanischer Lloyd since 1989.

SECA MANUALS

Target Date 11 August

Claus Tantzen was very pleased: in April, Germanischer Lloyd handed over fuel change-over manuals for 52 container ships ranging from 1500 TEU to 7500 TEU to the Director, Technical Fleet Management, of German ship operator E.R. Schiffahrt. "These documents are the best tools when dealing with port state controls," Tantzen emphasized. While the E.R. Schiffahrt fleet does not navigate the waters of the world's first sulphur emission control area (SECA), the Baltic, the coast is now clear for smooth fuel change-over procedures whenever a ship enters the English Channel and the North Sea, which will become SECA No. 2 on 11 August 2007.

Change-over Procedure. "For a well-trained crew, a fuel change-over does not pose any difficulties," says Dr Reinhard Krapp, Manager of Germanischer Lloyd's Strategic Research department. "However, calculating the fuel mixtures is not exactly straight forward. We do this for the shipowners." In SECAs, ships are required to use fuels with a low sulphur content of no more than 1.5 per cent. Ships not equipped with two separate fuel systems must undergo a fuel change-over procedure.

A technically smooth transition is of utmost importance. Furthermore, proof of compliance must be submitted to the port state authorities. The Fuel Change-over Manuals (FCOM)

prepared by GL on a ship-by-ship basis satisfy both requirements.

Bunker volumes, transfer pump performance and daily fuel consumption: all this information is needed to prepare a fuel change-over manual. It is the blend of different fuel qualities that makes the difference. The fuel that flows from the settling tank to the service tank is already a mixture. The service tank is always full and the separators work at an even pace, but fuel demand from the ship's engine changes depending on the required power. Any unused fuel mixture from the service tank returns to the settling tank that is always filled at least 10 to 15 per cent.

The manual relieves the crew of the effort of making these calculations, providing a set of tables that indicates the correct change-over times for spe-

cific fuel consumption rates. As an added benefit, the manual helps to determine the feasibility of retrofitting separate fuel systems or even using low-sulphur fuels exclusively.

Helpful Schedules. The 67 container ships of E.R. Schiffahrt's fleet are estimated to make several hundred entries into, and exits from, the North Sea SECA each year. Captain Claus Tantzen has already informed his crews about the upcoming changes through a technical circular and an ISM Instruction. Now that GL's ship-specific manuals have been handed over, everything is ready for 11 August!

For further information: Dr Reinhard Krapp, Head of Department, Strategic Research, Phone: +49 40 36149-521, E-Mail: reinhard.krapp@gl-group.com



WELL PREPARED: Dr Reinhard Krapp (r.) and Dr Wolfgang Wehlte (l.) of GL handed over the 52 ship-specific fuel change-over manuals to captain Claus Tantzen of E.R. Schiffahrt.



AIR CONDITIONING. Absorption refrigeration systems by EAW Energieanlagenbau use waste heat generated by ships.

ABSORPTION REFRIGERATION

The Cold which Came in from the Heat

Protection of the maritime environment, emissions reduction and new energy saving concepts for ships were the main topics on the agenda of this year's conference of the Ship Machinery Committee of Schiffbautechnische Gesellschaft in Hamburg (www.stg-online.de). Engineer Dr Yves Wild presented his energy conservation concept: using exhaust and coolant heat for air conditioning by installing absorption refrigeration systems.

The underlying principle is simple: waste heat generated by ships, is put to good use as a source of refrigeration energy. But employing this technology in ships harbours new challenges: the systems must function reliably under all circumstances, even in high seas.

EAW Energieanlagenbau Westenfeld GmbH can deliver on the standards, says expert Dr Wild. EAW redesigned the traditional concept of absorption refrigeration machines, putting the containers upright. Bench tests under realistic conditions conducted by the German Military Technology Unit 71 have confirmed that the system cools effectively even under dynamic excursions of up to $\pm 20^\circ$, reported Dr Wild.

For assessing the economic feasibility of absorption refrigeration systems, the most important concern is fuel costs. During the last four years, fuel prices have risen dramatically. At current fuel costs, said Dr Wild, a 140 kW absorption refrigeration unit can generate potential savings of up to US\$ 38,000.

25TH CIMAC WORLD CONGRESS

Combustion Engines under Scrutiny

Leading engine manufacturers gathered in Vienna for the World Congress of the International Council on Combustion Engines (CIMAC) at the end of May. The quest for the fuel of the future and the search for an effective method for substantially reducing pollution caused by combustion processes were top items on an agenda comprising more than 270 speeches, presentations and roundtables.

Issues such as the sulphur content of fuels, the compatibility of different fuel types, CO₂ emissions from combustion processes or safety matters in ship operations – such as the prevention of crankcase explosions – were discussed in depth.

This was the 25th congress of its kind, joining experts in ship engine, plant and power generation technology for a one-week exchange of views

on a wide range of topics. CIMAC working groups presented the results of their work since the last conference.

Principal Topic: the Environment. The CIMAC Congress is a triennial event. While the last meeting in Kyoto focused mainly on operational questions, this year's 950 attendees agreed that environmental concerns would be the key subject area for years to come.

During the final discussion, the question first raised by Ernst Ulrich von Weizsäcker in his welcoming address was reexamined: What options do we have to respond quickly to global climate change? Conserve energy! Many welcomed the suggestion to generally run ship engines at lower speeds. Slowing down will conserve valuable resources and reduce emissions from combustion considerably



Photo: iStockphoto.com

while easing the strain on people and machines.

Conserving energy, increasing engine efficiency, supporting the use of alternative fuels and finding alternatives to CO₂ emitting combustion processes will be pressing issues in the future. The next CIMAC congress will be held in Bergen, Norway from 14 to 17 June 2010.

GARD

One Hundred Years of Success

Norwegian marine insurer GARD has more than one reason to celebrate: just in time for its centenary, both the P&I club and GARD's marine and energy business received a rating upgrade by financial researcher Standard & Poor's. "A+" is the highest rating possible and tells of the company's ongoing success.

GARD is an integrated insurance and risk management provider, founded in Arendal, Norway, by a group of sailing shipowners. The company always responded to historical developments by accepting steamships and

tankers, expanding into the offshore energy market, increasing the range of additional P&I covers and eventually moving into hull and machinery.

From 7 to 8 June GARD celebrated its anniversary with clients, members and partners in the company's head office in Arendal.

Germanischer Lloyd congratulates GARD on its achievements. In his allocution, Jan-Olaf Probst, Deputy Head of Division, Ship Newbuilding at Germanischer Lloyd, explained the development and future prospects of container ships.

Next to size and capacity, safety standards and longevity will increasingly determine the development of tomorrow's ocean carriers.

ASIA

New Head of Department

Holger Jefferies was appointed Head of the "Seagoing Ships Asia" department. The naval architect's duties include plan approval services for all ship newbuilding projects of Germanischer Lloyd in Asia. He has worked for GL Asia since 2004.

The Busan and Shanghai office provides comprehensive technical and design support for Asian designers, yards and owners. It also coordinates the annual GL Container Forum, as well as training programmes and other forum events.



RESPONSIBILITY.
Holger Jefferies, Head of Department,
Seagoing Ships Asia.

HELMEPA

Silver Jubilee

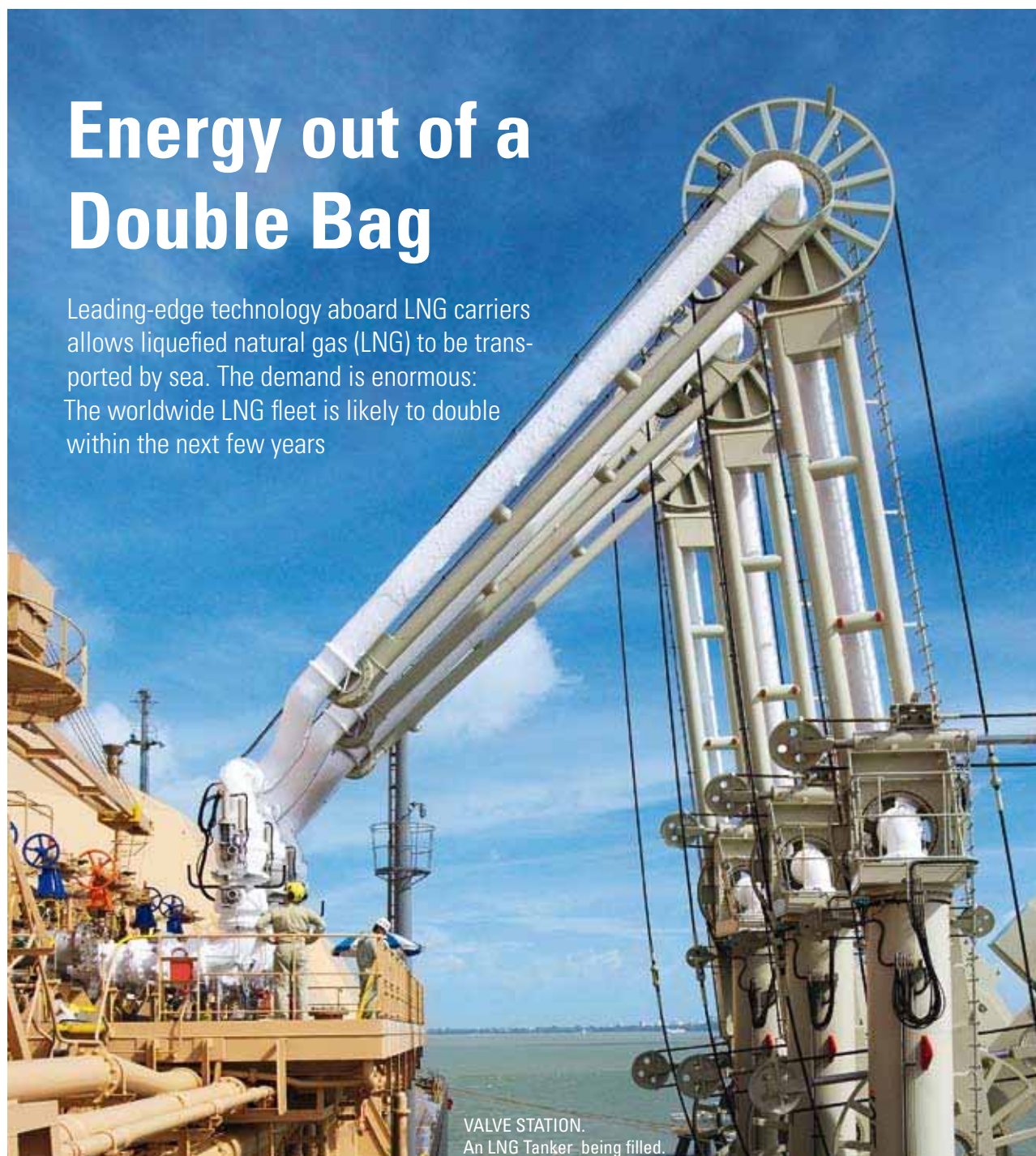
Germanischer Lloyd congratulates the Hellenic Marine Environment Protection Association (HELMEPA) on its 25 years of voluntary service "to save the seas".

The balance is impressive: 25 years of marine pollution prevention, 25 years of work on national and international environmental regulations, and 25 years of maritime training. A joint initiative of Greek seafarers and shipowners, the Hellenic Marine Environment Protection Association aims at eliminating ship-generated marine pollution and enhancing safety at sea.

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Energy out of a Double Bag

Leading-edge technology aboard LNG carriers allows liquefied natural gas (LNG) to be transported by sea. The demand is enormous: The worldwide LNG fleet is likely to double within the next few years



VALVE STATION.
An LNG Tanker being filled.

Photo: Centre for Liquefied Natural Gas

The man moves cautiously, as if in a space shuttle, focusing his attention like a technician in a cleanroom lab. Clad in a coverall, soft overboots, gloves and a helmet, he uses his flashlight to visually inspect thousands of metres of laser-welded seams inside a 40 m tall stainless steel tank onboard a ship. “GTT develops all the process data and computer software for membrane tanks internally,” the shipping expert explains. His French employer, Gaztransport et Technigaz (GTT), equips roughly two-thirds of the world’s advanced membrane carriers with leading-edge tanks.

In a process requiring utmost precision, the double-walled tanks must be installed in the ship’s hull. “This is very time-consuming,” says Georg-Alexander Martin, tanker specialist with Germanischer Lloyd. “Everything has to

be measured and fine-tuned precisely to avoid leakage.” If the liquid natural gas, refrigerated to a chilling 162 °C below zero, were to contact a large section of the ship’s steel structure, the hull would shatter like glass.

It takes more than two years to install the shiny circus tent made of thin, up to approximately 1.5 mm material, such as Invar, a steel alloy, or Triplex. This membrane rests flexibly in a shell of bonded wood strips within the ship’s hull, capable of accommodating 30,000 cubic metres or more of LNG. A ship may carry four or five of these enormous, hexangular gas containers in its belly. “The membrane is just a flexible bag unable to support itself,” says Martin. It is held up by a complex, multi-layered insulating structure composed of glass fibres, synthetic materi-

Fresh Energy at

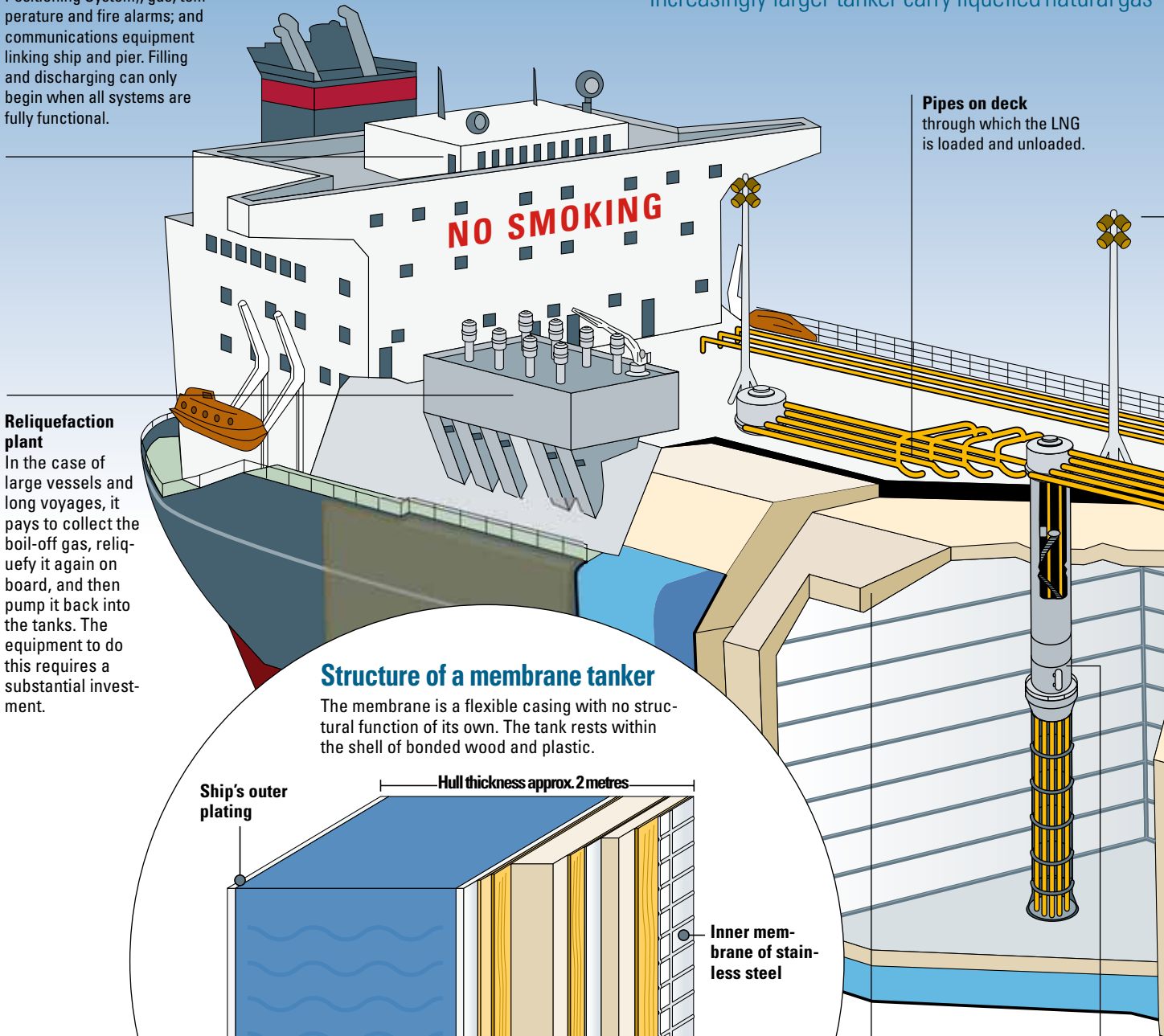
Increasingly larger tanker carry liquefied natural gas

The bridge

is equipped with GPS (Global Positioning System); gas, temperature and fire alarms; and communications equipment linking ship and pier. Filling and discharging can only begin when all systems are fully functional.

Reliquefaction plant

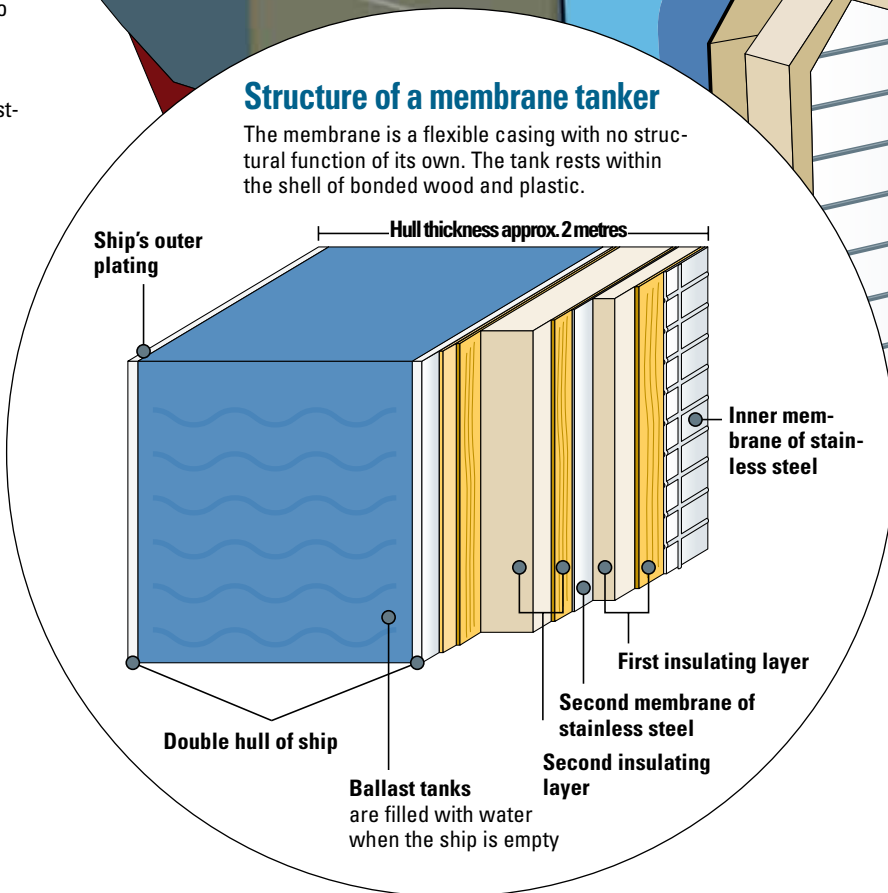
In the case of large vessels and long voyages, it pays to collect the boil-off gas, reliquefy it again on board, and then pump it back into the tanks. The equipment to do this requires a substantial investment.



Pipes on deck through which the LNG is loaded and unloaded.

Structure of a membrane tanker

The membrane is a flexible casing with no structural function of its own. The tank rests within the shell of bonded wood and plastic.



The outer skin of stainless steel, insulated by a layer of polyurethane or polystyrene foam, protects the inner aluminium shell. This prevents the LNG from warming up, expanding and generating too much pressure. The maximum pressure is 0.7 bar.

162 Degrees below Zero

in high-tech tanks of spherical and membrane design

Valves for escaping gas (boil-off)

The liquefied natural gas boils at the icy temperature of minus 162 °C throughout the entire sea voyage. As long as some vapour is allowed to escape from the tank, the pressure and temperature remain constant. This ensures that the liquefied gas stays cool.

Hose crane

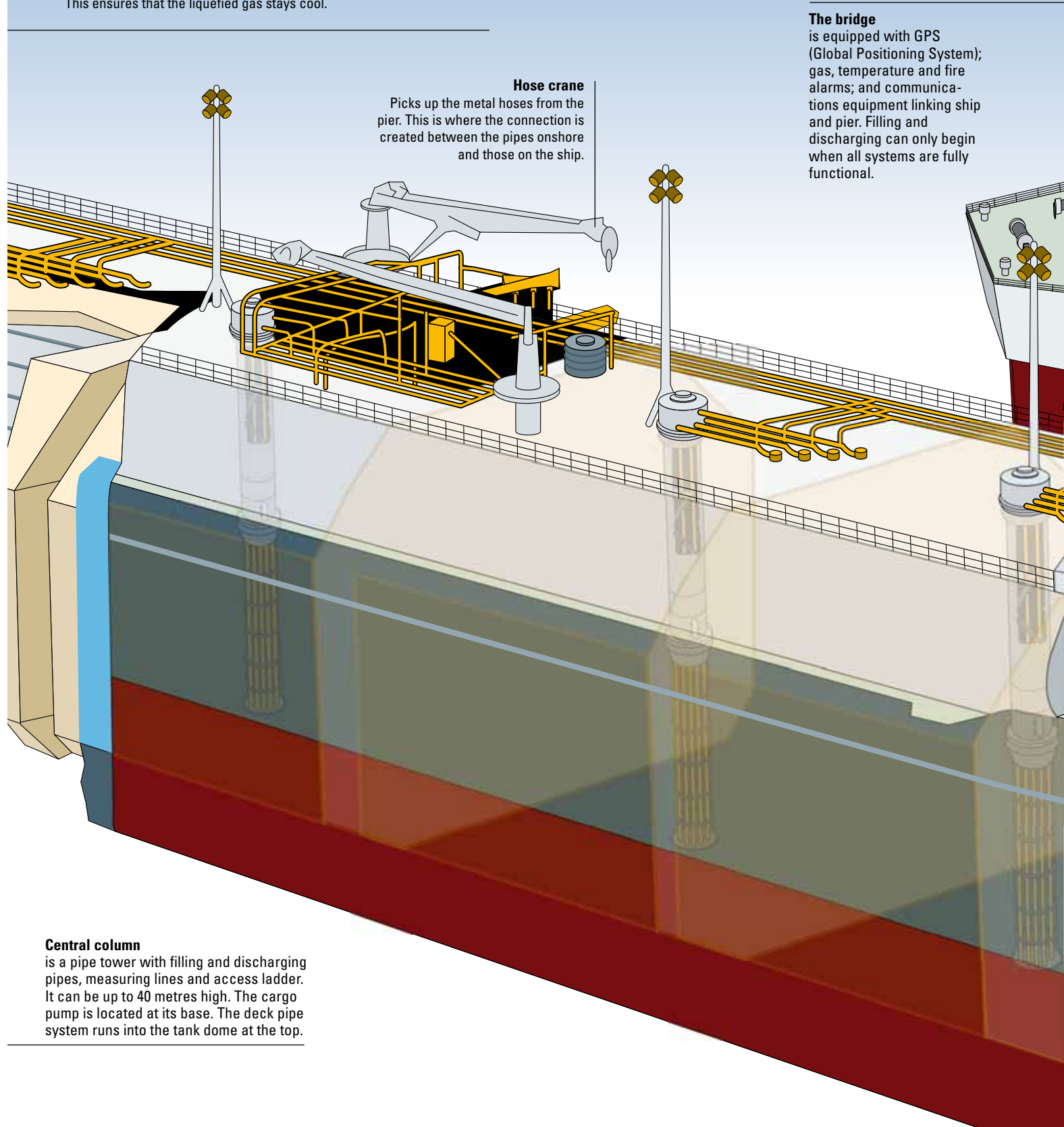
Picks up the metal hoses from the pier. This is where the connection is created between the pipes onshore and those on the ship.

The bridge

is equipped with GPS (Global Positioning System); gas, temperature and fire alarms; and communications equipment linking ship and pier. Filling and discharging can only begin when all systems are fully functional.

Central column

is a pipe tower with filling and discharging pipes, measuring lines and access ladder. It can be up to 40 metres high. The cargo pump is located at its base. The deck pipe system runs into the tank dome at the top.

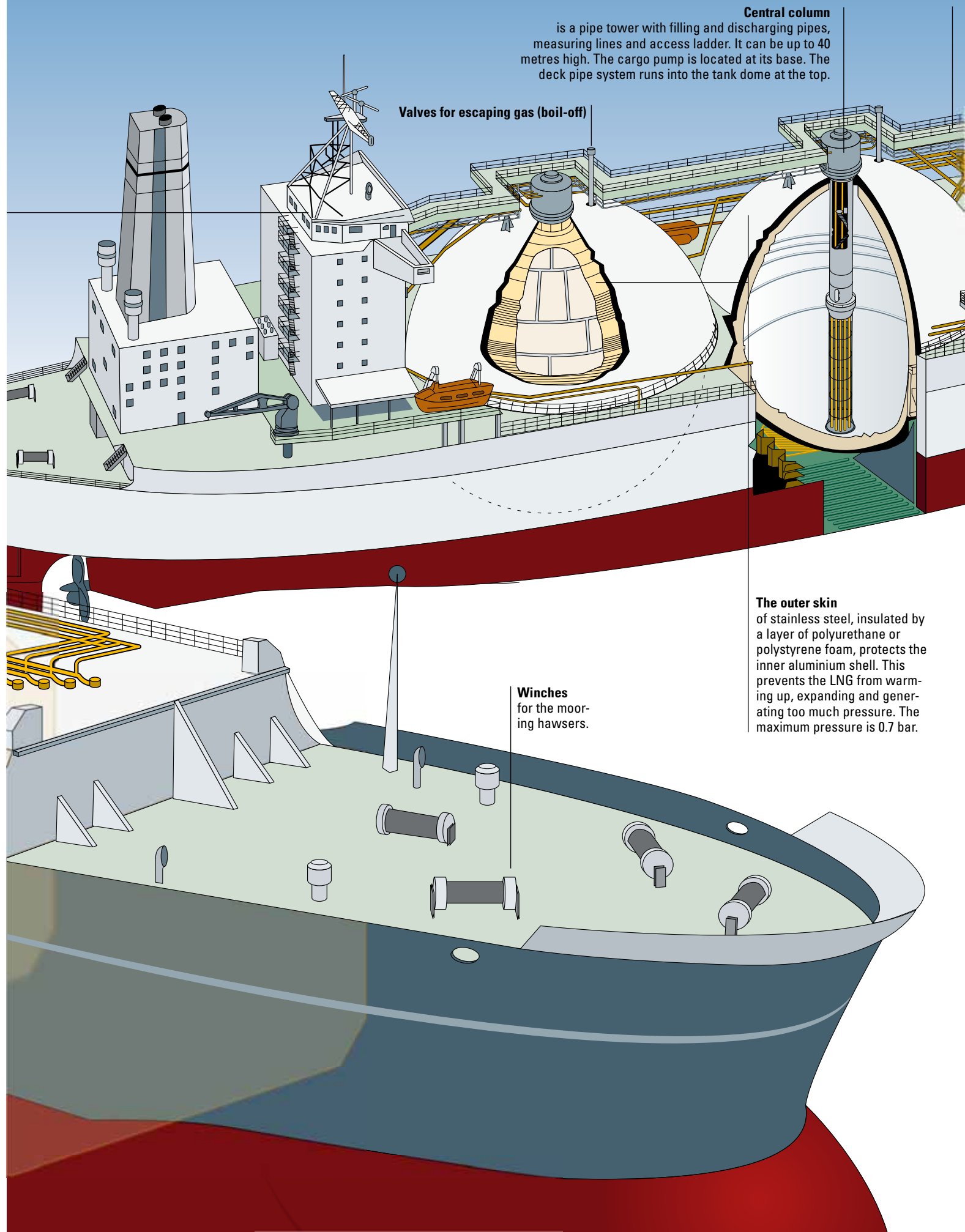


Central column is a pipe tower with filling and discharging pipes, measuring lines and access ladder. It can be up to 40 metres high. The cargo pump is located at its base. The deck pipe system runs into the tank dome at the top.

Valves for escaping gas (boil-off)

The outer skin of stainless steel, insulated by a layer of polyurethane or polystyrene foam, protects the inner aluminium shell. This prevents the LNG from warming up, expanding and generating too much pressure. The maximum pressure is 0.7 bar.

Winches for the mooring hawsers.



Catwalk
Walkway over the deck.

Pipes on deck
through which the LNG is loaded and unloaded.

Winches
for the mooring hawsers.

Lookout
above the bow to assist the bridge when docking and casting off.

Hose crane
Picks up the metal hoses from the pier. This is where the connection is created between the pipes onshore and those on the ship.

Tank skirt
An equatorial ring – part of the spherical tank, which is thus self-supporting – rests on foundations in the ship. A thermal brake, which prevents temperatures in the tank system from rising, is an important component here. The tank support skirt compensates for expansion or contraction of the spherical tank.

Tankers for LPG – liquefied petroleum gas

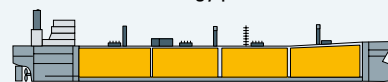
LPG is produced as a by-product of crude oil and natural gas extraction. LPG carriers bring their cargo direct from the production platforms in the North Sea to Brunshütten, the only LPG terminal in Germany. About 40 per cent of the LPG consumed in Germany is obtained during the processing of crude oil by refineries. LPG burns very cleanly and is sold as an automotive fuel and also in gas cylinders in the form of butane and propane. Owing to the relatively low volumes involved, LPG is a niche market; it makes up only one per cent of the total energy production in Germany.



LPG intercoastal tanker with pressure tanks for 3,200 m³ of LPG – ship length approx. 70 metres.



LPG seagoing vessel for 16,650 m³ of LPG – approx. 150 metres long.

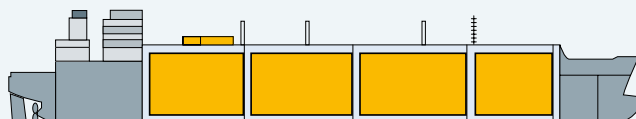
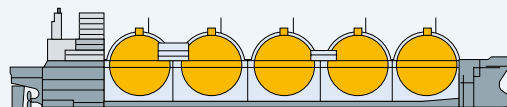


LPG seagoing vessel with approx. 80,000 m³ capacity – approx. 220 metres long.

Tanker for LNG – liquefied natural gas

Natural gas becomes liquid when it is cooled to minus 162 °C. In this state, it occupies one six-hundredth of its gaseous volume. This makes it possible to transport LNG by sea in ships. LNG is natural gas that is liquefied in the exporting country for transport and converted back to the gaseous state in the country of destination. It is transported to the consumers via pipelines.

LNG tanker with Moss-Rosenberg spherical tanks for 138,000 m³ of LNG. The vessels are approximately 290 metres long and hold the annual consumption of a small city with 56,000 households.



LNG tanker with membrane tanks. The largest vessels currently under construction have a capacity of 265,000 m³ and a length of approx. 350 metres.

al and a second barrier made of aluminium or other metal that will remain leak proof even in rough seas and extreme ship movements.

The cargo maintains its temperature of minus 162 °C for the entire duration of its trip covering thousands of miles, continuously boiling like water in a kettle, but much, much colder. As long as a small portion of vapour is allowed to escape from the “kettle”, or tank, the internal pressure and temperature will remain unchanged.

Advanced membrane carriers are increasingly replacing traditional ships with their conspicuous spherical tanks on deck. Those ball-shaped tanks, the “Moss Rosenberg System” originally developed in Norway, have been in use across the seas for thirty years. Compared to the new systems, they are easier to build. A shell of aluminium four centimetres thick, surrounded by layers of insulating material, prevents the gas from warming. This technology does have its advantages: while a membrane carrier has to remain at the fitting-out pier for tank installation for a long time, spherical tanks can be manufactured simultaneously. A spherical-tank vessel therefore takes much less time to complete. But there is a catch: spherical tanks are very heavy. Few ship-yards have cranes strong enough to hoist these behemoths into the ships. And apart from that, the sleek membrane carriers are more fuel-efficient.

A Free Carrier Market

Both ship types have double hulls. “LNG is a perfect fit for the diverse regional needs of our globalized world,” says British natural gas consultant James Ball. The first-ever natural gas transport by ship occurred less than fifty years ago. In 1959, a retrofitted tanker called Methane Pioneer carried the first cargo of 5,000 cubic metres across the Atlantic Ocean. Today, the floating pipelines regularly commute between gas-producing countries and their markets. An increasing number of terminals are boosting the LNG trade to satisfy a rising demand. Frequently, the owners of the current fleet of 228 carriers are the gas producers themselves; in other cases, gas-producing companies charter the ships.

But that is changing now. An emerging free LNG carrier market is dominated by independent shipowners letting their vessels for a limited time or transport quantity on short notice. “There are many new kids on the LNG block,” says Mark Ross, President of SIGTTO, the Society of International Gas Tanker and Terminal Operators, “and it is imperative that we take appropriate action to ensure they take safety as seriously as the established operators.”

There is a shortage of experienced crews for the fast-growing LNG carrier fleet. At the world’s shipyards, more



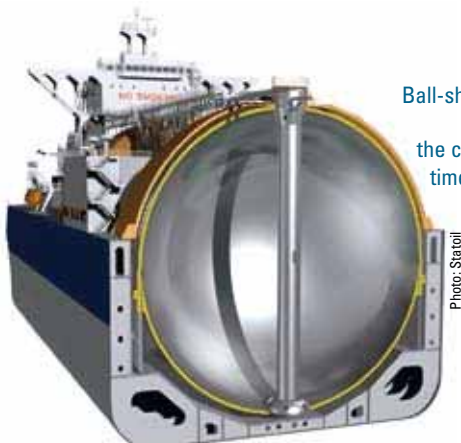
Photo: Naventia

MEMBRANE TANK. More capacity, higher efficiency.

than 145 vessels are on order. Three quarters of them are being built in South Korea by Daewoo, Samsung or Hyundai Heavy Industries. Daewoo alone employs 2,000 ship designers for cargo ships of all types. All three shipbuilders have formed a common technology pool that unmatched by any competitor worldwide. “While Japanese shipyards are standardizing to reduce costs, we are committed to fulfil every single request of our customers,” says Park Dong-hyuk, Vice President, Product Management at Daewoo. In mid-April, the Korean national energy corporation Kogas made arrangements with the three shipbuilding giants to try out their newly-developed membrane tank system. So the French manufacturer GTT may soon face competition.

As early as 2015, more than 400 LNG carriers are expected to be in operation. Counting extra crews for backup, sick leave or holidays, the LNG industry will need about 9,000 additional skilled crew members at sea. On each ship, a minimum of ten crew members must provide proof of special training. With the current demand exceeding the short-term training capacities, skilled crews are a hot item on the market. The monthly wage of an captain has risen from US\$12,000 to US\$16,000 within a short time. “To hire any of my officers, shipowners now have to pay a transfer fee,” says Croatian crew manager Lahor Magazinovic. “It is just like football.” ■ CS

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CLASSIC. Ball-shaped tanks reduce the construction time of tankers, but they are heavy.

Photo: Statoil



Photo: © BP



Photo: Semptra LNG

MEGA-PROJECT. Energía Costa Azul is one of the largest gas projects in Mexico. The transfer area consists of a jetty and a breakwater. Natural gas transported by LNG carriers is discharged with a flow rate of 12,029 m³/h. The liquefied natural gas will be stored in two cryogenic tanks whose nominal capacity is 160,000 m³ each. The current schedule indicates that by the end of 2007 all installation and construction activities will have been completed.





Sealifting Energy to Baja California

LNG tankers will soon be delivering billions of cubic feet of liquefied natural gas (LNG) to Mexico's northwestern coast. A gigantic receiving terminal currently under construction in Baja California will serve as a distribution hub for consumers in Central America and the U.S.

ENERGÍA COSTA AZUL.
Terminal of Receipt, Storage and
Regasification of Liquefied Natural Gas.

At the Costa Azul, extending along the northwestern coast of Mexico from about 15 miles north of Ensenada to 55 miles south of the international border, a leading-edge technology project is taking shape: Sempra LNG, a subsidiary of Sempra Energy, is building one of the largest liquefied natural gas (LNG) receiving terminals in North America.

The US\$ 875 million project is named "Terminal of Receipt, Storage and Regasification of Liquefied Natural Gas – Energía Costa Azul". It will be capable of supplying one billion cubic feet (Bcf) of natural gas per day. Up to 500 million cubic feet per day of natural gas from the terminal will be used to meet the growing energy demand in Baja California.

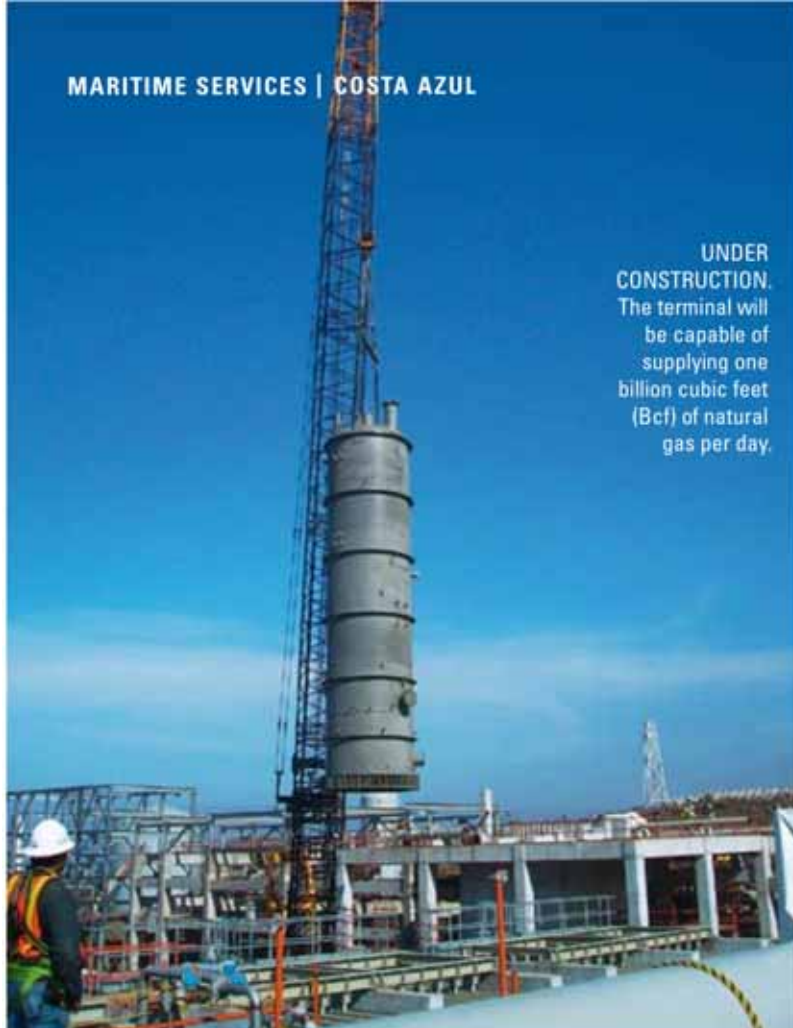
Operating Start-up in 2008

The gas will be made available to power generating plants and diverse industries in the region via a new 45-mile, 42" gas pipeline that is currently under construction. This pipeline will interconnect with the existing "Gasoducto Bajanorte" which transports gas to both Mexican and American customers. This project owes its great importance to the fact that Baja California doesn't have any natural gas reserves of

its own and is not connected to Mexico's distribution and transmission networks. Currently, Baja California imports all gas it consumes from the United States through pipelines. Construction of the new facility began during the first quarter of 2005. Slated to begin operating in early 2008, it will be the first LNG project on North America's west coast.

LNG from liquefaction plants located in various parts of the world will be transported to Mexico by LNG carrier ships and received at a berthing and unloading platform. Four unloading arms will transfer the liquefied gas to two cryogenic tanks, each with a capacity of 160,000 m³. These full-containment LNG storage tanks are being built according to Mexican NOM standards and the LNG industry's most stringent safety standards. The outer tank walls consist of 650 mm of steel-reinforced concrete; the tank bottom and the annular space between the outer wall and the inner tank wall, consisting of 9% Ni-carbon steel, is cellular glass and perlite insulated.

The LNG carrier berth will be protected by means of a breakwater structure that was designed based on a ship simulation study as well as numerical and physical modelling. The LNG is regasified in open-rack evaporators →



UNDER CONSTRUCTION. The terminal will be capable of supplying one billion cubic feet (Bcf) of natural gas per day.



→ using seawater as a heating medium. The regasified natural gas will be metered and then delivered to Gasoducto Bajanorte for transport to the final user.

Engineering Review

For the Energía Costa Azul Project, GL Mexico serves as an "Independent Verification Agency" required by Official Mexican Standard NOM-013-SECRE-2004, "Safety requirements for the design, construction, operation and maintenance of storage terminals of liquefied natural gas including systems, equipment and receipt facilities, conduction, vaporization and delivery of natural gas".

The purpose of GL Mexico's verification activities is to monitor compliance with the Official Mexican Standard, as well as international standards and practices for engineering, design, materials, construction, commissioning and start-up.

GL's verification activities include a FEED review (completed) and a detailed engineering review, procurement

inspection, construction supervision, and witnessing of factory acceptance tests of major components.

A highlight of the project was the raising of the roofs for the LNG storage tanks on 26 June and 28 July, 2006, respectively. The preassembled, 529-ton, 77m diameter roof structures were lifted 38.9 m on a cushion of air at the rate of about 0.2 m per minute. Giant fans helped get the job done by raising the pressure within the tank to about 1.24 kPa. Once each roof was in its final position, it was welded into place. When finished, the tanks will stand 53.7 m tall with an outer tank inside diameter of 77 m.

Upon completion of all installation and construction work, GL Mexico will issue to Energía Costa Azul, and thereby to the Comisión Reguladora de Energía, a "Start-up Operation Report" indicating that the plant is ready to be taken into operation. ■ CG

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KEYWORD LIQUEFIED NATURAL GAS (LNG)

Natural gas, a fossil fuel extracted from the ground, is refrigerated to -162°C or -260°F to condense it into a liquid. Liquefied natural gas (LNG) has only 1/600th the volume of its gaseous state.

Once produced by the well, the gas is transported to a liquefaction terminal where it is purified and condensed. The liquefied gas is then shipped in LNG tanker vessels, enabling it to travel large distances from regions where natural gas is abundant to countries in need of energy. An LNG tanker works like large thermos, keeping the liquid gas refrigerated until it reaches the receiving terminal. A worldwide fleet of more than 150 LNG ships deliver about 14 billion cubic feet of LNG per day. All natural gas consumed by Japan and Korea is delivered in this form, and countries like France and Spain have become major consumers of LNG, as well. At the receiving harbours the gas is stored, regasified and injected into pipelines that take it to its final destination.

LNG is odourless, colourless and non-toxic; it is lighter than water and in its liquid state it is lighter than water and non-combustible. LNG is 65 per cent lighter than air, causing it to dissipate rapidly.

Propulsion Alternatives

There is a tremendous need for LNG carriers. But next-generation ships with capacities in excess of 150,000 m³ demand more advanced propulsion technologies. An overview

Opportunities for shipbuilders continue to be encouraging, and even more so, for suppliers of diesel technology. The demand for liquefied natural gas (LNG) is expected to double this decade, with global demand shifting from the Asian market to North America and Europe.

The growing importance of North America as a destination calls for ships capable of covering longer distances. The current fleet will likely double in size over the next 10 years. The seaborne trade in liquefied natural gas is on course for double-digit annual growth through to 2020. The need for ships is tremendous. More than 130 LNG carriers of up to 263,000 m³ are currently on order worldwide. Many of them will be equipped with conventional steam turbines. But next-generation ships with capacities in ex-

cess of 150,000 cm³ demand more advanced propulsion technologies.

The Challenge of Fuel Costs

Produced from the wellhead, natural gas consists of methane, ethane, propane and some heavier hydrocarbons, as well as small quantities of nitrogen, helium, carbon dioxide, sulphur compounds, and water. After removing certain impurities such as water, nitrogen, carbon dioxide, hydrogen sulphide and other sulphur compounds, the gas is liquefied by refrigeration at a temperature of approximately minus 162 °C. It now takes up only 1/600th of its volume at atmospheric conditions. In this super-cooled, liquid form LNG is ready for shipping. The first-ever LNG sea transport took place in 1959 in a converted general cargo ship →

Photo: Stefanie Normann





Photo: Wärtsilä

BIG BLOCK. The Wärtsilä 34SG is a four-stroke spark-ignited gas engine that works according to the Otto process and the lean-burn principle. The engine has ported gas admission and a pre-chamber with a spark plug for ignition.

→ travelling from the US to the UK. In the mid-Sixties the first purpose-built ship was launched. Two different designs were developed for LNG ships: the Kvaerner Moss design, carrying the cargo in independent spherical tanks, and the membrane-tank system using thin, flexible membranes supported only by the insulated hull structure.

Both tank systems rely on expensive insulation to keep the liquefied gas refrigerated during the voyage and minimize evaporation. Nevertheless, an amount equivalent to roughly 0.15 per cent of the cargo evaporates per day. To keep the tank pressure close to atmospheric conditions, this boil-off gas (BOG) has to be released from the tanks. In the past 40 years, this gas has generally been used for fueling the ships' steam-turbine propulsion systems, so far the most commonsensical way of handling the BOG. A typical 125,000 m³ to 150,000 m³ LNG carrier is usually equipped with a 36,000 shp to 40,000 shp steam turbine powered by boilers that can burn both BOG and HFO.

Fuel costs have always been a challenge for ship designers and operators. With rising bunker costs, this issue becomes ever more critical. Engine manufacturers have invested substantially in R&D to deliver new power generation concepts for ship propulsion. Considering the relatively low inherent efficiency of steam turbines, the demand for alternative propulsion systems is on the rise.

Attempting to reconcile the objective of low fuel consumption with the necessity of consuming the boil-off gas, innovative systems take a variety of approaches, depending on the specific transport concept, such as the carrying capacity of the vessel, its speed, the duration of its voyages and other factors. Any comparison of alternative concepts of LNG carrier propulsion and auxiliary energy generation must consider the overall complexity of LNG transport. Draught constraints may lead to a twin propeller design. The selection of a propulsion system has to account for fuel gas and oil prices, power plant efficiency, vessel size, speed, and many other parameters. Today, LNG carrier operators can basically choose between the following systems:

Steam Turbines

Steam turbines are the traditional propulsion system of LNG carriers. Usually two BOG/HFO-fuelled boilers generate sufficient steam for the main propulsion turbines and auxiliary engines. A diesel generator is used as an additional power generating unit. BOG from the cargo tanks is compressed to approximately 0.1 MPag, then preheated and delivered to the boilers. If a sufficient amount of BOG is not available, the boilers can be partially or fully fuelled with HFO. One important advantage of the steam turbine system is the fact that no gas combustion unit is necessary. All BOG is used in the boilers or may be reliquefied via the condenser. Both HFO and BOG can be used as boiler fuels. The maintenance and lubricating costs are considerably lower than in other systems.

On the other hand, low BOG fuel efficiency and higher cargo transport costs (US\$/mm BTU) are clear disadvantages. Large LNG carriers require more power than existing turbine designs can deliver. Moreover, finding crews qualified to operate steam-turbine systems is getting more difficult as fleets continue to grow.

Dual-Fuel Diesel Electric (DFDE)

Dual-Fuel Diesel Electric (DFDE) driven ships are equipped with an electric propulsion system powered by dual-fuel, medium-speed diesel engines. In gas mode, these

INNOVATIVE GAS CARRIERS

I.M. Skaugen Relies on GL Expertise

Four LPG/ethylene/LNG carriers have been ordered by Norwegian shipowner I.M. Skaugen at a Chinese shipyard. With a cargo capacity of 10,000 m³, these vessels will be the first representatives of the next generation of gas carriers employing C-type tanks.

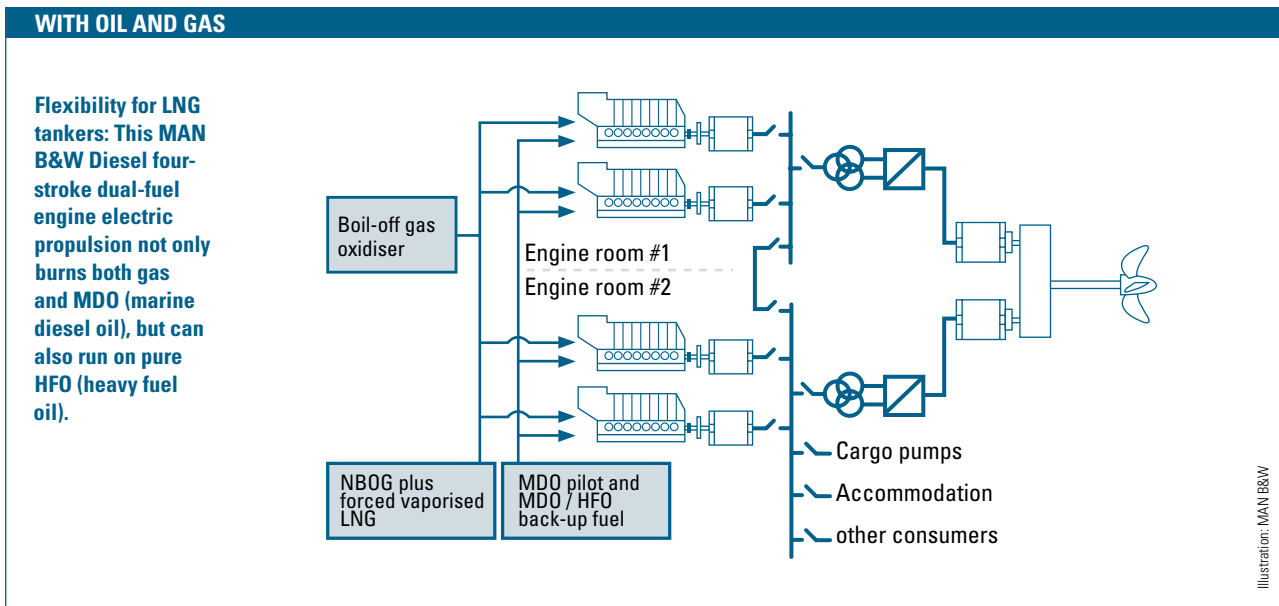
Capable of carrying any type of liquefied gas, they are highly versatile. When transporting LNG, the tanks are

maintained under atmospheric pressure. A unique arrangement allows LNG boil-off to be reliquefied in a low-temperature reliquefaction plant.

I.M. Skaugen has a fleet of 42 vessels. 17 of their 18 LPG/E carriers are GL-classed. Three tankers for liquefied petroleum gas (LPG) and chemicals from a Chinese yard were commissioned in September 2005. The new tankers will

be equipped with four stainless-steel pressure tanks with a total capacity of 5,800 m³ for liquefied gas or chemicals, as well as seven coated tanks totalling 3,900 m³ for organic chemicals, resulting in an overall capacity of 9,700 m³.

The ships for the Norwegian shipowner have a maximum draught of eight metres and a deadweight tonnage of 10,200.



dual-fuel engines run on low-pressure natural gas with about 1 per cent of diesel added. They can switch over to traditional marine diesel operation at any time. When burning gas, the engines use the Otto combustion process whereby a lean gas and air mixture is ignited together with a small amount of diesel as a pilot fuel.

Vessels burning BOG and/or HFO for propulsion and utility power generation must be equipped to handle excess BOG. Gas Combustion Units (GCU) offer an appropriate means to burn large volumes of boil-off gas when necessary and power a reliquefaction plant, e.g., during a shutdown of one or several of the dual-fuel engines. In addition, a GCU is needed to dispose of residual gas from the cargo tanks when they have to be made inert prior to inspection.

High efficiency and low emissions, along with fuel flexibility, are major advantages of this propulsion system. The downside is the need for a GCU.

Low-Speed Diesel with a BOG Reliquefaction Plant

A new solution has been introduced to the LNG shipping industry recently: instead of using boil-off gas from the cargo tanks to generate propulsion and electric energy,

ships are propelled by conventional low-speed diesel engines consuming HFO. Electric power is supplied by conventional HFO/MDO diesel generator sets. The boil-off gas is reliquefied and fed back into the cargo tanks. An additional GCU allows BOG to be burned in the event of a reliquefaction plant shutdown. This system permits LNG to be transported without any loss of cargo.

During ballast voyages, the cargo tank temperature can be maintained by spraying reliquefied LNG back into the cargo tanks. This helps reduce the initial increase of BOG on laden voyages. The use of conventional machinery in ships of this type to take advantage of the well-known efficiency of low-speed diesel engines in combination with economic auxiliary diesel engines may be an attractive option for owners of large LNG carriers that require a high output rate and service speed.

Combined Cycle Gas/Steam Turbine Electric (COGES)

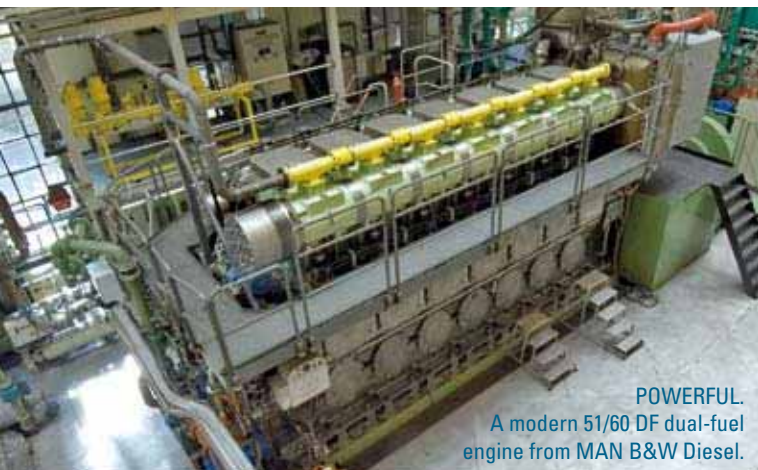
This system combines three different components for power generation: diesel engines, a gas turbine, and a steam turbine produce electric energy for main propulsion and all auxiliary systems. HFO or MDO is used for the conventional medium-speed diesel generator sets. A marine gas turbine, usually an aero derivative, fuelled by gas from the cargo (BOG), drives a generator connected to the electric power system.

A boiler, heated by the gas turbine exhaust, produces steam that drives another turbine/generator set. A GCU is included to burn BOG in the event of a gas-turbine shutdown. For LNG carriers up to 140,000 m³, the advantages of the COGES system are especially attractive: due to its compact layout the relation between engine space and cargo space enables approximately 10 per cent more cargo to be carried on board than with other designs. In addition, marine gas turbines fuelled by LNG represent an environmentally friendly solution with the lowest NO_x and SO_x emissions. On the other hand, this system consumes valuable cargo for propulsion.

■ GAM

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THE POWER OF SYMBOLS.
EU Environment Commissioner
Stavros Dimas in front of an
offshore wind power plant.

“A Question of Responsibility”

Stavros Dimas, EU Commissioner for Environment, has positioned himself as an uncompromising campaigner for environmental protection. In his interview with *nonstop*, the EU Environment Commissioner spoke about ocean protection and his political aims

nonstop: Mr Dimas you must be very pleased that with the UN Report on climate change the discussion on environmental issues has finally reached the broad public. Where does the EU stand in terms of environmental achievements?

Stavros Dimas: Our biggest achievement for the period 2004–2009 will be the progress made in tackling climate change, both internally in the EU and on an international level. By the end of my term as Environment Commissioner, we will be well on the way to reaching our Kyoto target of reducing greenhouse gas emissions by 8%. The EU Emissions Trading Scheme is a key tool for success. It puts a price on emissions of CO₂ and drives the establishment and expansion of the global carbon market. EU targets on energy efficiency and renewable energy encourage the development of clean technologies.

THE “ADVOCATE FOR THE ENVIRONMENT”

Stavros C. Dimas (65) has been European Commissioner for Environment since November 2004. A Greek national, he studied law and economics in Greece and the USA. He worked as a lawyer for the Hellenic Industrial Development Bank, the World Bank and the Wall Street law firm Sullivan & Cromwell. Beginning in 1997, he was elected to the Greek parliament ten consecutive times. Top positions he held in Greek politics were those of Minister of Trade, Minister of Agriculture and Minister of Industry, Energy and Technology. From March to October 2004, Dimas was European Commissioner for Employment and Social Affairs.

The Greek government nominated Dimas for the incoming Barroso Commission which took office on 22 November 2004. In a speech to a committee of the European Parliament, Dimas announced four main priorities for his term in office: climate change, biodiversity, public health and sustainability. He emphasized the importance of the Kyoto protocol, the Natura 2000 project, the REACH directive, and the need to better enforce existing EU environmental legislation. His challenge is to ensure that economies are not overregulated while leading the way in environmental protection within the EU.

On the other great global environmental challenge we face, the loss of biodiversity, we are working hard with member states and other stakeholders to make sure we will meet our target of halting biodiversity loss in the EU by 2010. The strategy and action plan we published last year are the key to our success.

Under the Commission's Better Regulation agenda, EU environment policy is being updated to become more effective. New policies are more transparent and cost-effective. Advances are being made in improving the implementation of EU environmental legislation.

nonstop: You consider yourself an “advocate for the environment”. What is your environmental vision for the European Union in 2010, 2020 and 2030?

Dimas: Over the next 30 years, environmental issues will become more and more prominent and increasingly global. Our capacity to convince our international partners to act will be a critical factor for preserving a clean and healthy environment. Public pressure for more effective environmental action will increase, prompted by instability and by the realization that a poor environment impacts the economy.

Climate change will stay high on the political agenda for the foreseeable future. Air quality is significant for the health of citizens: we will have a better understanding of how particulate matter and chemicals impact our health, and take measures to reduce them.

The environment-energy-competitiveness triangle should become mutually supportive. To think that one can build future growth without taking the environment into account is an illusion. Resources are finite and responsible stewardship means managing those resources effectively and efficiently.

nonstop: The maritime industry, comprising the sectors of shipping, shipbuilding, ports, fisheries, offshore energy production and tourism, constitutes an important economic factor in all European coastal states. The economic utilization of the common maritime space raises a number of questions, including environmental issues. In what ways does the Green Paper on Maritime Policy address environmental topics? →

→ **Dimas:** Marine ecosystems are the basic resource for marine economic and social activities. Their protection is a precondition for developing the thriving maritime economy, which is what the future EU Maritime Policy seeks to achieve. This is fully recognized in the Green Paper.

The Green Paper states that the EU Marine Strategy – adopted in October 2005 – will deliver the environmental pillar of the future Maritime Policy. The Strategy, which includes a proposal for a directive, aims at achieving a “good environmental status” of the EU’s marine environment by 2021. This objective will need to be taken into account in all policy initiatives to be adopted within the framework of the future Maritime Policy.

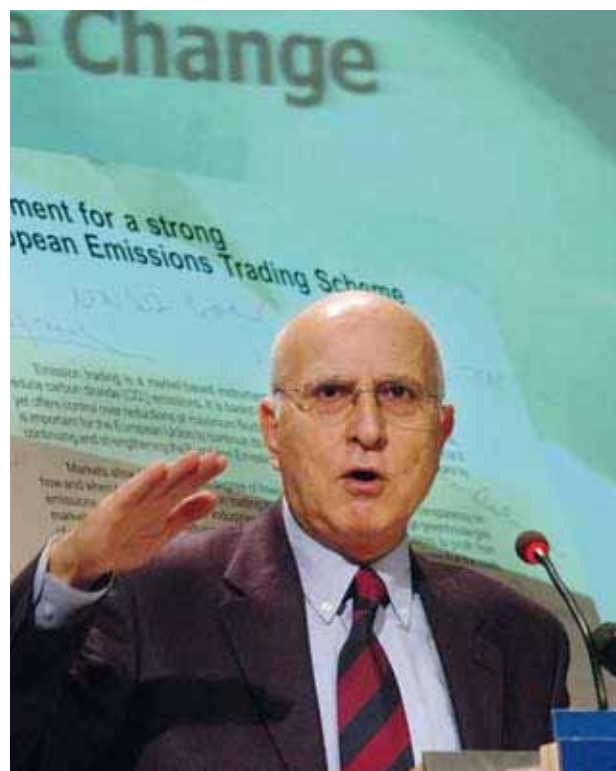
The future Maritime Policy will also complement the Marine Strategy. In particular, the future Maritime Policy emphasizes the need for more comprehensive data and deeper knowledge, and fosters policy integration, which will benefit environmental objectives.

nonstop: The International Maritime Organization (IMO) has long been working on reducing air pollution. Last year, Marpol Annex VI came into force and the Baltic Sea was established as a SECA; the North Sea will follow this year. Can we see an acceleration in the speed of discussion processes?

Dimas: The entry into force of the Sulphur Emission Control Areas (SECAs) in the Baltic Sea and the North Sea later this year are to be welcomed, but it should be remembered that Marpol Annex VI was adopted as far back as 1997 and at that time it only covered the Baltic Sea. The North Sea was only included after a subsequent proposal was adopted. In addition, it is widely recognized that some of the provisions of Annex VI are not particularly ambitious in terms of the environmental benefits they will deliver. For example, the global sulphur cap for marine fuels is currently set at 4.5% whereas the global average level is around 2.7%. Similarly, engine emission standards for nitrogen oxides are very conservative relative to what was and is technically possible for engines built after 1 January 2000. Moreover, air pollution from ships remains a serious problem worldwide, and the current air pollution standards in Annex VI are simply not sufficient. Due to the continuing growth in maritime traffic, this annex will not lower air pollution from ships but only slow its rate of increase. Also, standards for fine particles (PM), responsible for serious health problems, should be introduced. It is for these reasons that the IMO has already launched a process to revise Marpol Annex VI. I am confident that we will see an acceleration in the discussions, and that the parties to the IMO will be able to agree on ambitious amendments to improve fuel quality and reduce emissions. This will better protect both the health of many people living in coastal areas and the natural environment. Countries and regions are obviously more likely to impose regional policies and measures if IMO does not deliver serious progress.

nonstop: What role does “cold ironing” play in the reduction of air emissions, and how can the EU pave the way?

Dimas: The health impacts of air pollution from ships depend on where the pollutants are produced, among other things. Emissions of sulphur oxides or particulate matter on the high seas will have less impact than emissions close to shore. Therefore, emissions in ports are especially relevant as they tend to be close to residential areas. Cold iron-



“Protection of the environment is a precondition for developing the thriving maritime economy”

Stavros Dimas

ing, the use of electricity from land-based sources to run the equipment of ships at berth, can play an important role in reducing local air quality problems.

To stimulate cold ironing, the Commission adopted a recommendation on the promotion of shore-side electricity for use by ships at berth in EU ports last year. This communication serves as an incentive for member states to take action and to harmonize standards to the greatest extent possible.

It is up to member states and ports to balance the costs and the environmental benefits, which also includes reductions in noise levels. Also, the Marine Fuel Sulphur Directive provides for a maximum level of 1,000 ppm sulphur in fuel used for ships at berth as of 2010. This too will reduce air pollution in ports.

nonstop: The commission is exploring the possible use of market-based instruments to reduce ship emissions. How can this be realized?

Dimas: Here we need to divide ship emissions into two categories: noxious pollutants and CO₂.

Noxious pollutants are dealt with by Marpol Annex VI and by the marine fuel sulphur directive. This legislative approach works well but when a port, country or region desires additional action to reduce emissions, economic instruments can be useful tools to stimulate clean ships or clean ship operations. In several Nordic ports, economic instruments and financial support have resulted in serious reductions of NOx emissions. This success might be extended if other European ports follow this example. However, for the moment there are no plans for such an approach for the whole of the European Union.

As for CO₂, due to the steady increase in maritime traffic,

Photo: © European Community, 2007



CALL FOR ACTION. The challenge of global warming is a top item on the agenda of the entire EU Commission at Berlaymont Building, not just for Environment Commissioner Dimas.

ship emissions of CO₂ are becoming more and more significant even though ships are an efficient mode of transport. The Commission is looking at options for reducing these emissions. A consultancy report has indicated three options for doing so. One is to bring ships under the EU Emissions Trading Scheme for greenhouse gas emissions. Another is to differentiate harbour dues in favour of efficient ships. A third option is to apply binding efficiency standards to ships calling at EU ports. These and other options will need further study to find out which is most effective, enforceable and open for other countries to join in.

nonstop: It seems that the scrapping of ships is not primarily a European issue. However, what responsibility must the European players shoulder?

Dimas: In so far as more than a third of the world fleet is European-owned and a bit less is European-flagged, the scrapping of these ships is also a European issue. We have the responsibility to ensure that our old ships, which contain a lot of hazardous materials, do not end up as hazardous waste in poorly managed facilities, for example on



IN FOCUS ON SHIPPING. According to Dimas, the maritime industry is a major focal area for action.

Photo: © European Community, 2007

Asian beaches, and endanger the life and health of workers and the environment there. The Commission is currently preparing proposals for an EU strategy which should help us reach this objective.

nonstop: Is the potential of inland shipping already used to its fullest? What options for environmental improvement do you see in this sector?

Dimas: Inland shipping is significantly further ahead compared to seagoing ships as far as reductions in air emissions are concerned but there is still room for further improvement. To accommodate this, the Commission has recently launched a proposal on fuel quality standards that covers inland navigation, among other things. This proposal entails a stepwise lowering of sulphur in fuel from 1,000 ppm to 300 ppm by 2010 and to 10 ppm by 2011. As for sea going ships, their current standards are 45,000 ppm in general and 15,000 ppm in SECAs.

This fuel quality for inland navigation will make it possible to use different technologies like particulate filters to further reduce air pollution from vessels' engines, particularly emissions of particulate matter which is widely regarded as being the most serious pollutant in terms of human health.

nonstop: One of your most important projects is the REACH regulation (Registration, Evaluation and Authorization of Chemicals). It will introduce a single, coherent EU system for the control of chemicals, placing the burden of proof on the industry (both manufacturers and importers), rather than the public authorities, to demonstrate that the substances they are supplying are not potentially harmful. How will this impact shipping?

Dimas: REACH will be phased in gradually from 1 June 2007 over the next 11 years and will increase the level of protection of health and environment significantly while maintaining competitiveness and encouraging innovation.

The health and environment benefits of REACH will be significant: about 30,000 substances produced or imported in quantities above 1 tonne per year will be systematically tested and assessed. Authorizations will be required for using the most dangerous ones; it will be possible to ban certain uses much more quickly. If REACH succeeds in reducing diseases due to chemicals by as little as 10%, the health benefits will amount to more than 50 billion Euro over 30 years. Tens of thousands of cases of infertility, cancer, skin disease, neurological disorder and other illnesses will be avoided and all this money could be spent on improving the quality of life or the business environment.

REACH will require an assessment of around 10,000 substances to see whether they are persistent and bio-accumulative – a hazardous property directly relevant for the marine environment and possibly affecting the food chains and ultimately our health. Of particular concern are substances that disturb the hormone system and can lead to the collapse of entire fish and invertebrate populations.

As downstream users, ship builders and ship users will be better informed about the substances they buy and use, due to improved safety data and recommendations for safe use. This will improve the working environment at the shipyards and on board ships.

Substances of very high concern may become subject to authorization or substitution with less dangerous substances or technologies. REACH will allow Community-wide bans to ensure a level playing field across all 27 member states. Had REACH been in place when it was discovered that the risks of TBT (Tributyltin) should be addressed, market-distorting bans of individual member states could have been avoided.

■ MP

Her Excellency of the Seas

With AIDAdiva, shipowners AIDA Cruises and Meyer Werft shipyard have set new standards for high-tech cruise ship building. Germanischer Lloyd certified the club ship – and ennobled it with the new “GL Excellence – 5 Stars” standard

Asked the afternoon before the christening whether he was nervous, captain Przemislaw Kurc curtly answered, “Yes”. The same was probably true for the entire crowd of 350,000 who, in spite of cool April temperatures, didn’t want to miss the light show on the edge of Hamburg harbour. Then, on 20 April 2007 at 9:15 p.m., as the experienced captain was inching AIDAdiva forward amid gigantic beams of light and a flotilla of launches towards the place where the champagne bottle was waiting, most of the lookers-on had already booked their trip to the Caribbean – or so they imagined.

AIDA Cruises ordered the first of four Sphinx class club ships from Meyer Werft in October 2004. Germanischer Lloyd was “on board”, as well as the ship’s classification society. The engineering drawings and designs had been reviewed by GL long before the keel was laid. The shipyard, the shipowner and the classification society have been collaborating successfully for over ten years. Their first cruise ship, the AIDAcara, was commissioned in 1996.

“We make sure the shipowner’s technical concepts are executed in full compliance with the regulations,” says Andreas Ullrich, Passenger Ship Type Manager with GL, describing his side of the challenge. For the current ship,

AIDA Cruises and Meyer Werft again developed and implemented a number of innovative solutions. The spacious “Theatrium”, a theatre with an atrium located in the centre of the ship, was by no means a trivial technical achievement. On the contrary – the 3,000 square meter social centre of the cruise liner, extending across three decks, offers a unique experience of open space. Engineers had to do countless calculations to verify the stability of the structure.

Advanced Technology

Powered by four diesel main engines rated 36,000 kW each plus two 24,800 kW propulsion machines, the AIDAdiva cruises at up to 22.5 knots. The cruiser had to satisfy the highest safety standards, redundancy being the keyword. The class code RP3x50% indicates that the function of either engine remains fully intact if the other one fails. This is the first-ever GL classed passenger ship featuring this high level of redundancy, encompassing pumps, coolant and supply systems.

By way of a computer simulation-based evacuation analysis, Meyer Werft was able to demonstrate that the ship offers a sufficient number of secure escape routes for its 2,050 passengers in any conceivable emergency situation.





Photo: Ingrid Friebak

LIPSTICK. The final touches on the trademark smile.



THEATRIUM. Burkhard Müller (2nd from l.) and Michael Ungerer (2nd from right) of AIDA Cruises receive the "GL Excellence – 5 Stars" certificate from GL's Torsten Schramm (l.) and Andreas Ullrich (r.).



Photo: AIDA Cruises

INTERIOR. The "Oasis" onboard the cruiser is the perfect place to relax.

Various design alternatives were calculated and analyzed using the AENEAS software tool, developed jointly by Germanischer Lloyd and Traffgo. This tool generates a realistic simulation of passenger flows. It automatically applies the international rules for Ropax ships introduced in 1998.

5-Star Certificate for Excellence

By insisting on the highest safety and quality standards, AIDA Cruises has underscored its uncompromising commitment to excellence. The day after the christening, Torsten Schramm, COO Germanischer Lloyd, presented the "GL Excellence – 5 Stars" certificate to Michael Ungerer, AIDA Cruises Senior Vice President, Operations and Burkhard Müller, Vice President, Fleet Services. The certificate attests to the ship's above-average performance with regard to safety, environmental compatibility and operation. AIDA Cruises and their fleet meet 13 requirements from the categories of management systems, reliability, operation, environment, ethics, safety and convenience, including excellent port state statistics, compliance with the ILO Convention concerning crew accommodations on board, as well as the GL Emergency Response Service.

With the GL ShipManager and Maritime Social Responsibility certificates, AIDA Cruises demonstrates compliance with additional requirements. The five stars stand for five management systems: ISO 9001, ISO 14001, ISM, ISPS and OHSAS 18001. "GL Excellence" documents the ship's operational reliability and high quality standards. Now that the media commotion about the "goddess" AIDAdiva is calming down, it is time to look forward to the "beauty": AIDAbella will be delivered in the spring of 2008. ■ SN

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HIGHLIGHT. The light spectacle in honour of AIDAdiva at Hamburg harbour.

Photo: AIDA Cruises / Kay Nietfeld



CEREMONY.
Namesake Aila Langh
christens the multipur-
pose vessel.



Photo: Langh

Aila – Class 1A Super

The family-run company Langh Ship has received a new multi-purpose cargo vessel with the highest ice class from the Sietas yard – and is giving the Finnish Register of Ships fresh impetus

The weather god smiled upon the ceremony, and the bottle of champagne smashed on the ship's bow just as it should. In brilliant sunshine and with a good stiff breeze, the christening of the 907 TEU multi-purpose vessel "Aila" took place as planned at the J.J. Sietas shipyard in Hamburg. With a length of 141 metres and a beam of 21.5 metres, the ship has a deadweight capacity

of 11,300 tonnes, a gross tonnage of 9,131 and a service speed of 17.7 knots. The newbuilding was ordered from J.J. Sietas by Hans Langh, Managing Director of Langh Ship, a shipping company based in Piikkiö, Finland. The sponsor and namesake for the vessel was the shipowner's wife, Aila Langh. Speaking to a large number of guests, she wished the cargo vessel good sailing.

SIETAS SHIPYARD: SHIPBUILDING WITH TRADITION

Since its founding by Carsten Sietasch, the J.J. Sietas yard has remained a family-owned firm. The success story of the company from Hamburg-Neuenfelde began back in 1635 with the construction of wooden boats and cutters made of oak and beech. Progressing from schooners, brigs, galleasses and large sailing ships to stone-carrying lighters, fishing cutters and full-masted schooners, the shipyard earned a worldwide reputation in the course of time. The conversion from wood to steel shipbuilding took place from 1908 onwards. Towards the middle of the 20th century, Johann Jacob Sietas developed the serial construction of coasters. In 1966, Sietas built the world's first container ship



for which the design was based on the dimensions of ISO containers. The "Bell Vanguard" came under way with GL class in 1967. Today, 900 employees at J.J. Sietas produce chiefly container ships with capacities ranging from 700 to 1500 TEU. In this segment, the company is counted amongst the most important and respected shipyards in Europe. In 2006, Sietas completed 14 small container ships. The order level in August stood at 41 ships – third place of all the German yards.

The future is bright: Sietas is booked up until 2010 and, in the event that the container shipbuilding boom should ebb away, the traditional yard will concentrate increasingly on ro-ro and bulk carriers.

Photos: Sietas

LANGH SHIP: AN INNOVATIVE SHIPPOWNING COMPANY

In 1973, Hans Langh founded the company “Hans Langh Industrial and Ship Cleaning Services” in Piikkiö, Finland. Initially, the company offered high-pressure cleaning for the agricultural sector. After only two years of operation, Langh expanded his client base – and gained an increasingly firm foothold in the maritime industry: yards, oil refineries, the processing industry and forwarders.

The first vessel for his own shipping company, Langh Ship, was purchased by the Finnish entrepreneur in 1983 and named after his daughter Laura. Then, in 1989, the shipping company ordered three ships from the J.J. Sietas yard in Germany – the first vessels in Europe with an integrated cleaning system in the cargo hold that had been developed by Hans Langh. This innovative system permitted the rapid cleaning of dirty

holds after the unloading of raw materials such as coke, coal, kaolin and salt. Within a very short space of time, the hold could be cleaned and made ready for the next cargo. Today, all ships of the Langh fleet are equipped with this system.

The inventive shipowner is also responsible for designing special containers which make the transportation of certain cargoes, e.g. steel coils, much safer and the operating procedures faster and more cost-effective. The current portfolio of Langh Ship ranges from shipping and maritime technology through crewing of the own fleet up to financial administration.



Photo: Langh

FAMILY FIRM. Captain Markku Yli-Kahri, Laura Langh-Lagerlöf, Hans Langh, sponsor Aila Langh, Chief Engineer Jouko Ruohomäki and Linda Langh.

“Aila” is the second unit of a series being built for Hans Langh in Hamburg. Its sister ship “Linda” was delivered at the beginning of the year. Both freighters are built to the rules of the highest Finnish ice class “1A Super” and are thus well equipped for navigation in icy waters. “Aila” will, for example, be taken into service by Saimaa Lines in the north of the Gulf of Bothnia and the Gulf of Finland.

The Langh shipping company has six multi-purpose cargo vessels with a total capacity of over 46,600 dwt and container stowage space for 3586 TEU. The Finnish shipping company currently employs more than 115 seafarers and offers many trainees their first taste of a maritime career.

Added Thrust for the Finnish Register

“Linda” and “Aila” are the first ships to be entered into the Finnish Register for many years. Shipowner Langh hopes that this positive sign for the maritime industry in Finland will herald a time in which many more ships will be sailing under the Finnish flag. At present, however, the Finnish fleet is still quite small. For some years now, Langh has been active in the world of politics, with the aim of

changing this situation and creating the prerequisites for a prosperous industry. For this to happen, the operating conditions for Finnish shipping companies must first be improved. For example, taxation in Finland has not yet been adjusted to reflect EU standards.

Hans Langh is a family man through and through, so it comes as no surprise that he is involving both of his daughters, who have already been working in the family company for a long time, more strongly in the activities of Langh Ship and also Hans Langh Industrial and Ship Cleaning Services. From now on, they will work at his side as fully fledged partners. “I’m very pleased that both of them were willing to take this step towards accepting more responsibility. From their childhood, the girls have been involved in the activities of the firm. That is surely an excellent starting point,” smiles Langh. His daughters make a fine team: Laura Langh-Lagerlöf has a master’s degree in economics, and Linda is a lawyer. ■ SG

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YARD WITH TRADITION. J.J. Sietas in Hamburg-Neuenfelde has been building ships since 1635.



FOREFATHERS. At its 1927 anniversary, Germanischer Lloyd celebrated the society's history of 60 eventful years.



140 years of Germanischer Lloyd stand for 140 years of technical progress, innovation, safety consciousness and the highest quality objectives. From the very beginning, the classification society had to stand up to strong competition. Its economic situation was chiefly influenced by unstable political conditions. In the end, however, these historic challenges only made Germanischer Lloyd stronger than ever before: thanks to the persistent advancement of its Rules, the Society is now one of the world's leading technical supervisory organizations. In a series, nonstop highlights the most important events in the history of Germanischer Lloyd. In part two, we portray the years between 1889 and 1945.

Forward through Rough Sea

1889 is an important year for Germanischer Lloyd. Its transformation into a stock corporation laid the cornerstone for its successful development. But crises and wars throw back the classification society

From cooperative association to stock corporation: the change of legal entity placed Germanischer Lloyd on a stable economic footing. The positive development can be traced by the number of ships in class: while a total tonnage of just 590,000 GRT was classified by Germanischer Lloyd in 1890, it was more than seven times as much in 1914 with 4,521,000 GRT.

Of growing significance here was the cooperation with See-Berufsgenossenschaft (See-BG), founded in 1887 as the shipping employers' liability insurance association. It was tasked by the Marine Accident Insurance Act with issuing accident prevention regulations to improve the level of safety on board, and with ensuring that these regulations were also observed. To prevent double supervision of the ships and at the same time to reduce costs, it seemed expedient for the technical division to enter into a cooperation with Germanischer Lloyd. A contract was drawn up to govern the details and duly signed in 1894. Germanischer Lloyd was appointed to act as an adviser to See-BG in all technical matters. For foreign countries in particular, its surveyors were to be available to See-BG as needed.

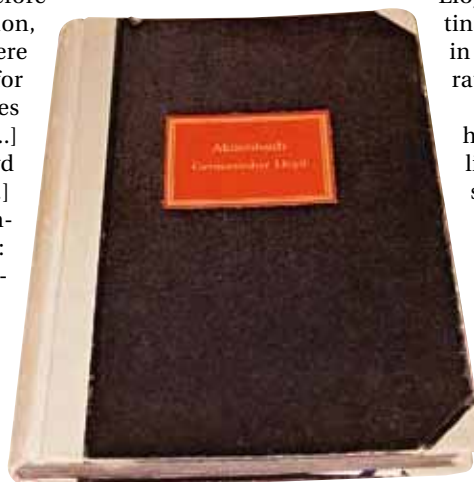
Partners in Safety

This teamwork was to stand the test of time. On the occasion of the 60-year anniversary of Germanischer Lloyd in 1927, the administrative director of See-BG declared: "See-Berufsgenossenschaft considers Germanischer Lloyd to be its best and first source of advice in all matters concerning the safety of shipping. [...] It is therefore [...] our need, born of deepest conviction, to express our most cordial and sincere gratitude to Germanischer Lloyd [...] for all its efforts over the last three decades in the interests of seafaring safety [...] and to request that Germanischer Lloyd uphold this trustworthy partnership [...] over the decades to come." It was to endure for more than just a few decades: the 100-year anniversary of the partnership was celebrated in 1994. With some amendments, the original contract of 1894 was still the basis for cooperation – and remains so up to the present day.

The partners were subjected to their first "endurance test" less than a year after the contract was signed, namely early in 1895. When, on 30 January 1895, the German fast steamer "Elbe" sank after colliding with an English steamship, leading to the loss of 336 lives, questions of ship safety were again foremost in the public eye. Vociferous demands were made for stricter control of shipping by the government. These were roundly rejected by the then Chancellor of the Reich, the Prince of Hohenlohe-Schillingfürst, with reference to the fine teamwork displayed by Germanischer Lloyd and See-Berufsgenossenschaft, but he added: "Nevertheless, should there be any sign of fault in future, the government will not be able to avoid having to introduce state surveillance of the shipbuilding industry."

This announcement was instrumental in pushing forward two essential improvements in the sector of ship safety – advancements in which Germanischer Lloyd played a key role: in 1896, See-BG compiled regulations on the subdivision and strength of watertight bulkheads on passenger steamers, on the basis of a technical expertise produced by Germanischer Lloyd. In the same year, another expert appraisal was published by Germanischer Lloyd on the safety benefits which would be offered by a mandatory load line mark – an idea which was not very popular with the ship-owners. After all, the more cargo transported, the greater the profit. In the end, prudence won: the load line rules issued by See-BG have been in force since 1903. These rules were based on the recommendations of Germanischer Lloyd, which also took part in the multinational conference on load lines held in London in 1906. The new regulations ratified there came into force in 1908.

Germanischer Lloyd's work on behalf of See-BG was on no account limited to providing expert advisory services. Whereas only 99 ships were surveyed in 1895, this number jumped to 780 the following year. According to a decision by See-Berufsgenossenschaft, all ships →



RECORDS. The share register lists all shareholders, including their names, birthdates and addresses.



→ with a hold capacity of more than 50 cubic metres had to be surveyed, irrespective of whether they were sailing with or without class – a ruling which effectively placed all ships of this size or larger under the supervision of Germanischer Lloyd.

In no small measure, the efforts of Germanischer Lloyd had anchored an awareness for ship safety in the public consciousness. Its significance was impressed once again upon the entire world by the “Titanic” catastrophe in 1912. The “Titanic” Conference of 1914, in which the Director of Germanischer Lloyd participated as emissary of the German government, gave birth to the SOLAS agreement (Safety of Life at Sea). However, its ratification was prevented by the outbreak of World War I.

World War I hit Germanischer Lloyd like a bombshell. In the years leading up to the war, the Society had been on a strong course of growth. Its financial position had developed extremely well since 1889. When war broke out, almost ten per cent of the world merchant fleet was classed by Germanischer Lloyd, including three of the largest and technically most sophisticated vessels in the world: the ships of the “Imperator” class. Germanischer Lloyd enjoyed a good reputation far beyond the borders of Germany; it had a closely knit network of surveyors and maintained excellent international relations.

After the war began, the ships administered by See-Berufsgenossenschaft were no longer overhauled. This eliminated an important source of income for Germanischer Lloyd. States that had been trusted contractual partners became wartime enemies overnight. Numerous foreign ships changed their class, and many German ships were seized, sunk or trapped in the ports of neutral countries. All of these ships could no longer be surveyed.

Steady Progress

To some degree, the loss of income was offset by construction supervision for warships and by the surveys of requisitioned vessels for the Naval Office. In addition, Germanischer Lloyd classified inland waterway vessels and Danube towing barges for the Bayerischer Lloyd shipping company. Despite the war, a few newbuildings were built to Germanischer Lloyd class, for example the “Cap Polonio” constructed in 1915 by Blohm & Voss.

In general, however, the income situation was anything but encouraging. To make matters worse, the operating expenses increased as a result of the hostilities. 1917 saw the 50th anniversary of the founding of Germanischer Lloyd. In peacetime, this jubilee would surely have been celebrated with the appropriate festivities. But, with the country at war, the only commemorative act was the submission of

TECHNICAL ADVANCES: FROM SAILING SHIPS TO STEAMERS AND MOTOR VESSELS

1819 The “Savannah” is the first “steamship” (although still fully rigged) to cross the Atlantic. The crossing takes 25 days, of which 18 are under steam.

1826 The Austrian forestry engineer Joseph



Ressel invents the marine propeller. It replaces the paddle wheels, which are ill suited to heavy seas and river navigation, thus making steamships fit for ocean duty.

From 1872 The double-expansion (compound) steam engine is introduced. The demand for commercial steamships increases.

From 1883 Triple-expansion and, from about 1900, quadruple-expansion steam engines come into widespread use. The era of the tall ships ends, with the fast steamers and large passenger steamships making their triumphant entrance.

1907 The “Lusitania” and the “Mauretania” of the Cunard Line demonstrate that turbine propulsion is also economically viable for large steamships.

1914–1918 World War I: a lack of materials leads to the construction of ferro-concrete hulls.

Interwar period Motor vessels increasingly displace the steam-driven ships.

1942 “Hansa” shipbuilding programme: ships in three sizes, propelled by a coal-fired steam engine – an anachronism necessitated by the oil scarcity of the war.

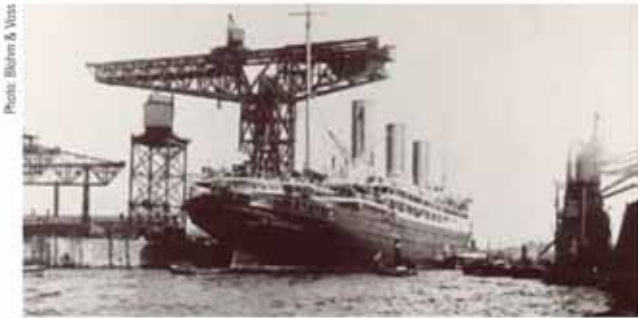


Photo: Blum & Voss

VATERLAND. Before WW I, this was one of the world's biggest ships – and it was classed by Germanischer Lloyd.

a report by the Executive Board to the Supervisory Board. From the closing words: "This retrospect shows that it has indeed been possible for Germanischer Lloyd to fulfil, through steady progress, the duties incumbent on a ship classification society. The good standing of Germanischer Lloyd in shipping circles, both within the country and abroad, appears to be well established, and there is every reason to believe that the German government regards the expectations made of Germanischer Lloyd as being met in full. This success is a great source of satisfaction for Germanischer Lloyd [...] and will act as an incentive for it to continue on its chosen course."

There is no reliable information on the chaotic final months of the war. The last Register Book had been published in 1916 as a kind of skeleton edition. In respect of construction rules, the minutes of the Supervisory Board reflect the following: "Work was progressing on the Construction Rules. We were prevented from holding further meetings through the outbreak of the revolution. Accordingly, it has not yet been possible to print and publish the Rules."

SOLAS and Load Line

The stock-taking at the end of the war yielded little hope for a rapid resumption of the Society's work. War losses and the obligation to make reparations, as prescribed in the Treaty of Versailles, had caused the German merchant fleet to shrink to less than 650,000 GRT. Whilst the reparations initially filled the coffers at Germanischer Lloyd, as the ships had to be surveyed before delivery, this was no cause for joy at the Society, since the basis for further work then fell away. At least the payment for surveys abroad was made in hard currencies. The first post-war Register Book was already published in 1920, and an operating profit was again made in 1922. Nevertheless, the 18 million marks reported for this year had to be regarded as being more of a theoretical value, owing to the galloping inflation.

With the currency reform, however, the situation improved. Germany's merchant fleet started to grow again, passing the 3.5 million GRT mark in 1926. For this year, Germanischer Lloyd was able to book 3.8 million GRT in tonnage under class. By the end of the 1920s, Germanischer Lloyd had again successfully re-established the international relationships which had been interrupted by the war, a process which found its visible expression in the Society's participation in the major international conferences of the time – SOLAS 1929, the International Load Line Conference of 1930, and the first conference of classification societies in 1939.

The lively research activities for which Germanischer Lloyd had always been renowned were reinstated. Their results were incorporated into the Rules for Classification and Construction. For example, Germanischer Lloyd drew up rules for arc welding on seagoing ships, which

DISASTER. The sinking of the "Titanic" made ship safety a concern for everybody.



contributed greatly to the rapid acceptance of the new technology. In 1932, the Society participated in torsion experiments on a model, which yielded findings on the stress distribution, particularly at hatchway corners. In 1934, GL experts took part in an open-sea measurement voyage on the cargo and passenger ship "San Francisco", with the aim of investigating the wave-induced loads on the hull.

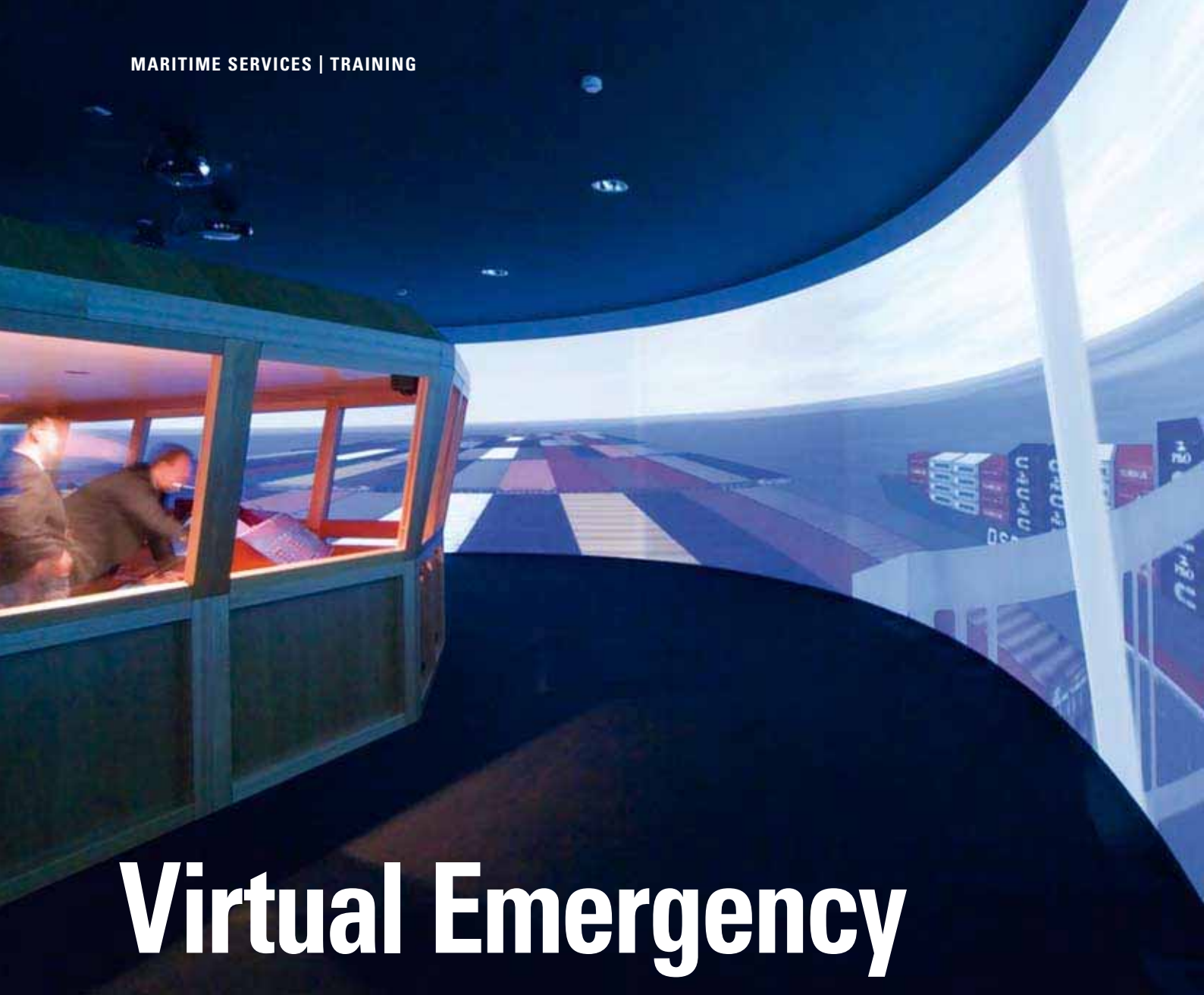
The worldwide economic crisis of 1929 also hit German shipping hard; many shipowners were forced to lay up their vessels for a time. A distinct recovery began in the mid-thirties. In 1939, Germanischer Lloyd was able to report a tonnage of 4.7 million GRT under class, corresponding to about seven per cent of the world merchant fleet – compared to ten per cent in 1914. But, before the prewar level could be reached again, the World War II broke out.

Facing Supply Issues

Once again, as in 1914, war disrupted the Society's international contacts. And, once again, most of the foreign ships changed class. Ships "were lost as a result of hostile acts. [...] Prize ships," said the Annual Report of 1940, "are to a great extent taken over by the Navy [...], to a lesser extent left to German shipowners [...]." As the war dragged on, the newbuilding activities at German yards practically came to a halt. The surveys of foreign newbuildings were not enough to compensate for the losses.

In addition, supplies were getting ever scarcer; diesel oil was the first resource to run short. In the interwar years, a gradual transition from steamships to motor vessels had been observed. Now the clock was turned back – of necessity: in 1942, the "Hansa" shipbuilding programme was introduced to produce ships with sizes from 2000 to 5300 GRT – ships that were coal-fired. Aircraft attacks and military action made normal business operations more and more difficult. Although the Register Book was updated constantly, it could not be published. Even the announcement of information on the classified fleet had to be postponed until the time after the war. ■ CS

Why the Allies did not succeed in dissolving Germanischer Lloyd at the end of World War II, and how Germanischer Lloyd was able to continue developing its technical expertise and expanding the classified fleet will be revealed in the next issue.



Virtual Emergency

Snow blizzards in Hong Kong, engine trouble on the high seas: to keep a cool head even in critical situations, shipmasters, officers and watchkeeping personnel prepare themselves in the new simulation centre of NSB Niederelbe Schiffahrtsgesellschaft

Practice makes perfect – training with simulators has established itself as a valuable component of vocational and advanced training for many positions of responsibility in both aviation and shipping. Sophisticated techniques are used to simulate the complex shipboard operations and to quantitatively describe the many sub-elements of ship's command on the basis of well-founded theoretical methods.

A special challenge is the training of emergencies, because a change of focus then takes place on the bridge. "It is necessary to handle a dangerous situation with priority without neglecting the classic processes of ship's command and marine engine operation," says Borchert Meyer, the responsible Director Nautical Operation at NSB Niederelbe Schiffahrtsgesellschaft mbH & Co. KG.

Headquartered in Buxtehude near Hamburg, Germany, the shipping company inaugurated the world's most modern simulation centre for the training of its nautical personnel early in 2007. The 270-degree and 120-degree bridge

simulators are located in the rotunda of the new head office, which was built on the grounds of a former brandy purification works. An engine simulator is also to be integrated in the course of this year.

The exercises using the 270-degree bridge simulator are based on incidents which have actually taken place on the River Elbe, in the South China Sea or in the Strait of Malacca. Such mishaps really belong in textbooks, because they offer excellent examples of what can go wrong. And, in everyday ship operation, a lot can happen. "That's why it is so important to refresh the training of the commanding personnel on our almost 100 ships regularly with regard to the inherent risks and dangers of navigation," cautions Meyer.

Depending on the respective degree of responsibility on the bridge, critical situations involving ships encountering or passing each other are run through in small groups or in individual training sessions – for instance, with a snow blizzard on leaving the Port of Hong Kong, which, with some 230,000 shipping movements a year, is one of the busi-



Photo: NSB

GERMANISCHER LLOYD – INDEPENDENT CERTIFICATION

Initial and advanced training in the maritime sphere is subject to the international regulations of the IMO, which must be implemented in national law by the member states. In conjunction with the SOLAS provisions governing the safe manning of ships (Chap. V), the STCW 95 Convention and Code (STCW = Standards for Training, Certification and Watchkeeping for Seafarers) lays down the details of the training courses and content stipulated for the crew members. This also covers the requirements affecting the use of simulators.

In order that training providers, their teaching systems, individual courses and the certificates issued to the participants can also be recognized internationally, it is necessary to have the conformity with these international regulations verified by independent experts.

Germanischer Lloyd audits training providers, systems and courses for compliance with the STCW 95 Convention and Code. In addition, customers are advised in matters concerning vocational training and skill enhancement and the corresponding certificates for the ship crews. The nautical colleges in Germany and their simulators as well as the training facilities operated by maritime administrations are certified. The certification of maritime training courses at home and abroad is not limited to the minimum requirements according to STCW but also – depending on the customer's needs – covers more wide-ranging topics, such as those included in the model courses of the IMO (Bridge Team Management, Maintenance, Crisis Management, Tanker Training etc.).

Furthermore, Germanischer Lloyd also examines and certifies non-maritime training institutes, training systems and courses in accordance with international codes and GL's own standards.

est harbours in the world. When fishing vessels cross the ship's path regardless of the consequences or when an engine failure leads to a blackout, even experienced captains find out how useful meticulous preparation for eventualities can be.

Realistic Scenarios

The masters and officers are all keen to take part in one of the courses offered at the NSB Academy during their next home leave. After all, they are the ones who bear the overall responsibility out at sea for the crew, ship and cargo. Today, the job of shipmaster has become much more demanding. The vessels are more complex and more valuable than only ten or twenty years ago. Navigational duties, the administrative overhead, ISM and ISPS all tie up a lot of time.

The courses at the NSB simulation centre are exactly tailored to the horizon of experience of the persons responsible on the bridge. Says Borchert

POWER CORE. The computer centre of SAM Electronics permits high-quality simulation in realtime.



Photo: Hansa

Meyer: "Appropriate exercise scenarios that could happen any day on the high seas are offered to and played through by the participants."

The ship handling simulator is an excellent tool for advanced training. Identifying hazards, evaluating the options and initiating suitable manoeuvres are amongst the most important aspects in the over 40 exercise scenarios, which were programmed with great diligence and attention to detail by the two instructors, Klaus Wagner and Alexander Jabs. The simulations were then analyzed thoroughly in replay mode with the firm's captains to identify specific instructions for action.

In the process, shipmasters learn to activate their experience and apply themselves to risky situations, with the aim of surmounting these difficulties and avoiding potential dangers for their vessel and its crew. The exercises in the virtual Strait of Malacca increase the participants' confidence in their own ability to keep a cool head in tough situations. The danger drills at the simulator are exciting yet extremely useful, because the trainee will, should the worst come to the worst, leave the training room only →



NSB ACADEMY. In the new training centre, seafarers of the NSB shipping company are able to rehearse their handling of dangerous situations.

Photo: NSB

→ with some embarrassment and sweaty palms if he infringes the collision regulations. In hard reality, all persons involved would have to justify their actions during a maritime casualty investigation.

With its new simulation centre, NSB is killing several birds with one stone. “Thanks to our simulation centre, the contact to our captains, the chief officers and NWOs is now much closer,” Borchert Meyer is pleased to say. Is the expenditure all worthwhile? That would seem self-evident: the shipping company employs about 500 captains and officers.

Great Versatility

To make sure that the training environment imitates the conditions on board as exactly as possible for the masters, chief officers and watchkeeping personnel, the bridge simulators have the same bridge arrangement that has been optimized by NSB for all its newbuildings. The original ship’s console furnished by NSB includes radar screens, digital charts and some 25 other instruments, displays and switches as part of the simulation. The shipping company’s own vessels can be simulated most realist-



Photo: NSB

270 DEGREES. In modern bridge simulators, the shipmasters, officers and watchkeeping personnel replay realistic scenarios set in various ports and on the high seas.

ically. In its capacity as prime contractor, SAM Electronics of Hamburg contracted with the Simulation and Training unit of Rheinmetall Defence Electronics GmbH to build a ship handling simulator especially tailored to the requirements of NSB. The system is controlled by means of an integrated NACOS Navigation and Command System (from SAM Electronics) as well as a 270-degree projection system. Type certification of the simulators was carried out by Germanischer Lloyd. Two instructor workstations with slave displays for the visualization systems are provided to operate the simulator. To heighten the realism, VHF maritime radio is simulated with a documentation

function, enabling simulator processes to be recorded and replayed whenever necessary. The system also comprises a station for pre- and post-exercise briefing and debriefing, which can take place at the same time as the exercises. The overriding aim is to be as flexible as possible in order to provide maximum utility for the many shipmasters and officers within a short time-frame. ■ OM

NSB NIEDERELBE SCHIFFAHRTSGESELLSCHAFT MBH & CO. KG

NSB has its headquarters in Buxtehude, Lower Saxony, Germany. About 170 staff members take care of the operational workflow of this progressive shipping company. A network of five branch offices in Alabama, Mangalia, Busan, Hong Kong and Singapore ensures optimum support for the ships. The fleet has a total carrying capacity of some five million dwt and a container stowage volume of about 430,000 TEU. Besides engaging in traditional ship management activities, the firm employs technical inspectors to supervise the newbuildings.

Last year alone, nine new container ships were taken into service, an LPG tanker came under way, 25 ships all over the world were called into the yard for class renewal or intermediate docking, and diverse site offices were opened for newbuilding supervision. Eight more container ships are due for acceptance in 2007.

Established in 1982, NSB is a shipping company that is enjoying strong growth. Today, it is one of the largest German ship operators, employing more than 2,500 seafarers.

service

Dates at a Glance

JUNE

12.06.2007 – 15.06.2007

NorShipping

Oslo, Norway

13.06.2007 – 15.06.2007

OGA 2007

Kuala Lumpur, Malaysia

27.06.2007 – 29.06.2007

International Maritime Defense Show (IMDS)

St Petersburg, Russia

SEPTEMBER

04.09.2007 – 06.09.2007

Baltexpo

Gdansk, Poland

04.09.2007 – 07.09.2007

Offshore Europe

Aberdeen, United Kingdom

18.09.2007 – 22.09.2007

Husum Wind

Husum, Germany

OCTOBER

02.10.2007 – 05.10.2007

KIOGE 2007

Almaty, Kazakhstan

03.10.2007 – 05.10.2007

Inmex India

Mumbai, India

24.10.2007 – 27.10.2007

Kormarine

Busan, South Korea

27.10.2007 – 04.11.2007

Hanseboot

Hamburg, Germany

NOVEMBER

06.11.2007 – 09.11.2007

Rotterdam Maritime

Rotterdam, Netherlands

27.11.2007 – 30.11.2007

Marintec China

Shanghai, China

28.11.2007 – 30.11.2007

Intern. WorkBoat Show

New Orleans, USA

DECEMBER

04.12.2007 – 06.12.2007

European Offshore Wind

Berlin, Germany

05.12.2007 – 07.12.2007

IX Pipeline Congress and Exhibition

Villahermosa, Mexico

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 > Client Support > Rules & Guidelines

I – Ship Technology

Part 1 – Seagoing Ships

Chapter 1

Hull Structures 2007-03-20

IV – Industrial Services

Part 6 – Offshore Technology

Chapter 2

Mobile Offshore Units 2007-06-01

Chapter 3

Fixed Offshore Installations 2007-06-01

VI – Additional Rules and Guidelines

Part 7 – Guidelines for the Performance of Type Approvals

Chapter 1

Procedure 2007-05-15

Part 9 – Materials and Welding

Chapter 2

Guidelines for the Fabrication and Inspection of Welded Pipelines of Copper-Nickel Alloys 2007-05-01

Part 11 – Other Operations and Systems

Chapter 3

Guidelines for Sea Trials of Motor Vessels 2007-05-15

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GL Rules and Programs 9.0

Selected Rules & Guidelines incl. Programmed Hull Structural Rules for Specific Ship Types 2007

Poseidon ND 7.0

Strength Assessment Tool for Hull Structures of Seagoing Ships 2007

service

Photo: Dreamstime

GL Academy

Selected Seminars in Hamburg (in English)

JULY

03.07.2007

ISPS Implementation Workshop

AUGUST

13.08.2007

Emergency Preparedness & Crisis Management

14.08.2007

Maritime Casualty Investigation in Shipping Companies

15./16.08.2007

TMSA Workshop – Risk Assessment, Change Management, Accident Investigation

OCTOBER

10./11.10.2007

Implementation and internal auditing of an environmental management system in shipping companies

NOVEMBER

08.11.2007

Oil and Chemical Tankers – Technical and Operational Aspect

14.11.2007

Bulk Carrier Basics

14.11.2007

Bulk Carriers – Technical and Operational Aspects

15.11.2007

Practical Aspects of Corrosion Protection for Shipping Companies and Shipyards

DECEMBER

03./04.12.2007

Company/Ship Security Officer (CSO/SSO) Training Course

05.12.2007

Ballast Water Management

11./12.12.2007

Internal Auditor ISM/ISO 9001:2000 for Shipping Companies

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Staff Changes

Essa Bayoumi is the new Regional Manager of Industrial Services Middle East in Cairo, Egypt.

Ulrich Behrens has been appointed as Manager of Engineering Services East Asia (ESEA). The former Engineering Services in China have been renamed ESEA based in Shanghai, China.

Manfred Breuer follows Gerold Schütz as Station Manager for the Station Office Goeje Daewoo in South Korea.

Gavin Fynn, up to now Deputy, climbed to the position of Country Manager South Africa with its head office in Durban.

Matthias Ritters, Surveyor, has been appointed as

Area Manager for the Area Middle East in Dubai (United Arab Emirates).

Tanjo Sinovcic, Senior Lead Surveyor, has been appointed as Technical Manager for Korea, Philippines and Japan.

IMPRINT

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news

GALIOM

Asset Integrity Management – Listening on the Pipeline

Achieving an optimal balance of cost and risk by minimizing unplanned downtime and optimizing production is a continuous challenge for operators of oil and gas platforms and facilities. Responding to these needs, Ger-

manischer Lloyd presented its new Asset Integrity Management software tool GALIOM to more than 80 representatives of the Arab oil and gas industry in Abu Dhabi.

Supporting. The Asset Integrity Management service is available worldwide as a plant operation support offering designed to ensure system integrity and deliver value-oriented maintenance driven by risk-based status evaluation of individual components. The GALIOM tool performs risk analyses, incorporating engineering, operational and economic aspects relevant to the respective project.

The development of GALIOM began in June 2004 at GL's Malaysian office which has been the GALIOM competence and development centre ever since. The first version focused on asset integrity management of piping, pressure vessels and pressure safety valves.

Updating. Earlier this year GALIOM version 2.0 was launched as an update with additional modules covering offshore pipelines, API 580/581



SOFTWARE. GALIOM 2.0 is available.

compliance and a "Management of Change" system. Current projects, the REHAB project of BP-GUPCO as well as projects for PEMEX, Mexico, Murphy Sarawak Oil and Murphy Sabah Oil, Malaysia, were respectively updated.

Ten additional modules are currently on the agenda, including Onshore Pipelines, Rotating Equipment, Electrical and Instrumentation, Structures and more.

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HOST. Hassan Fahim, Country Manager Germanischer Lloyd Abu Dhabi.

AMMONIA PLANT

On the Move

What do plastic toys, cigarettes, hair dyes, glass cleaners, fertilizers and headache pills have in common? They all contain the inorganic chemical ammonia. To meet the growing demand for ammonia, Green Dome Petrochemicals of the United Arab Emirates began installing a manufacturing plant in the Hamriyah Free Zone of Sharjah earlier this year. Once completed, the facility will produce anhydrous ammonia using natural gas as a starting material. The plant is laid out for a capacity of 1,180 MTPD (metric tons per day). What makes this project special is the fact that several parts of the plant had to travel a long distance to arrive at their final destination.

Ambitious Transport. The main plant originally operated in Kansas, USA before being dismantled and moved to its present location. Germanischer Lloyd has been entrusted by Green Dome Petrochemicals with the TPI (third-party inspection) of the mechanical structure of the plant, as well as the construction process. GL will check static equipment, such as heat exchangers, pressure vessels, reactors, reformers and pillars, as well as rotary and flow control equipment, including pumps, turbines and compressors. In addition, GL has been put in charge of worldwide vendor inspections for material and equipment supplied, and provides consulting services to the project management.



HEAVY LABOUR. Craning components to their right position.

BARD OFFSHORE I

Jacking-up to New Heights

Eighty wind turbines with a rated total capacity of 400 MW, located about 100 kilometres north of the island of Borkum, are scheduled to begin generating electricity in 2010, according to the plans for the BARD OFFSHORE I wind farm.

BARD Engineering, the company in charge of the project, has recently entrusted Germanischer Lloyd with the type approvals of all wind turbines, as well as certification of the entire wind farm project. The classification society will examine the design of the jack-up ship as a prerequisite for subsequent classification; in addition, Germanischer Lloyd will certify the energy and personnel accommodation platforms. The "Marine Warranty Survey" required by insurance companies will also be conducted by Germanischer Lloyd as an independent expert organization.

Giant Rotors. The design of the wind turbines developed by BARD Engineering sets new standards. Positioned 90 m

above the water line and 130 m above the seabed, each rotor has a diameter of 122 m and a rated generating capacity of 5 MW. For type certification, Germanischer Lloyd will scrutinize all components of the new equipment type based on the principles of the "Guideline for the Certification of Offshore Wind Turbines". This directive defines the general testing conditions, as well as safety systems and quality requirements for the production of the equipment. Furthermore, GL experts assist in taking measurements and readings on the prototype to verify turbine behaviour under real-life conditions.

The jack-up ship ordered will be 85.5 m in length and 36 m wide. It will have a draught of 4.5 m. Germanischer Lloyd handles the class-relevant design approval for the complete vessel including the engine room, the jacking system, the legs and the dy-



Photo: BARD Engineering

MAJOR PROJECT. Offshore windpark with jack-up ship.

namic positioning system. This design validation is based on the "Rules for Classification and Construction" laid down by Germanischer Lloyd.

Strong Crane. The ship will be equipped with a main crane with a maximum carrying capacity of 500 t plus two derricks with a rated capacity of 20 t each. The cranes are required to operate at a significant wave height of 2.6 m, i.e. a maximum wave height of up to 4.8 m, as well as a wind velocity of up to 14 m/s. A sophisticated ballast system will be employed to trim the ship during transit and counterbalance it during hoisting operations.

COLLISION BEHAVIOUR

Project Awarded

Florian Biehl received the WindEnergieZirkel Hanse's award for his research project on the collision safety of offshore wind power plants. The "Förderpreis Wind" was created to support young, innovative engineers. For his doctoral project at the Hamburg-Harburg Technical University, Biehl studied the collision behaviour of typical offshore substructures, such

as monopiles, tripods or jackets. He applied finite element models as well as area and volume elements to examine collision processes.

Safer Structures. He found that the damage to be expected on the ship and the offshore structure depends on their respective stiffness. If the ship is comparatively stiff and the offshore structure soft, the latter will fail without damaging the ship's hull. Based on the results of this study, supporting structures can now be reengineered to minimize the hazard.



AWARD. Florian Biehl (right) received the "Förderpreis Wind 2007" from Matthias Schubert (Vice Chairman of WEZ).



Photo: Michael Bogumil

GROUP PICTURE. Experts at the Hamburg headquarters of Germanischer Lloyd.

CONTAINER TERMINALS

Port Benchmarking

The quality and efficiency of container terminals are of great importance for smooth operation of the global supply chain. But how do you measure terminal operation standards? During their meeting in Hamburg, ten international experts in logistics – IPC, MTC, Yantian Hutchison, Eurogate, HHLA, the Hamburg Port Authority, Ingenieurbüro Dr. Wild, Global Institute of Logistics (GIL) and Germanischer Lloyd – discussed the development of a benchmarking system for terminals. They agreed that a standard is needed, including finan-

cial, operational and organizational indicators.

Good Performance. By request of GIL, Germanischer Lloyd will develop the Container Terminal Quality Indicator (CTQI) standard. This benchmarking system will be based on the results of various workshops. It will define methods and criteria for measuring the performance of a port within the supply chain, providing the industry with an entirely new instrument: In the future, shipping companies will be able to select those terminals that are best suited for their specific needs.

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It All Began with Gas Cylinders

The country office of Germanischer Lloyd in Malaysia was established in 1987. Today, it handles almost all major projects of the oil and gas industry in the Southeast Asian country

140 Years Globally – 20 Years Locally” was the motto for a celebration in Kuala Lumpur in honour of both Germanischer Lloyd’s anniversary and that of its activities in the Malaysian oil and gas sector. More than 100 local industry representatives participated, discussing the remarkable development of the region and its impact on the world economy.

“Malaysia is one of the most dynamic nations of the region with a vast range of business opportunities for Germanischer Lloyd,” said Rainer Schöndube, Member of the Executive Board, in his welcoming address. “Our personnel are dedicated to the ongoing challenge of supporting energy production in a very sophisticated and demanding environment.”

Today, GL Malaysia holds a 60 per cent market share. Bruno Solinas, Regional Manager East Asia, predicts a bright future: “We expect to increase revenues by 20 per cent by the end of this year.” The GL Kuala Lumpur office is the regional hub for Industrial Services. That wasn’t always the case. Germanischer Lloyd Malaysia was established in 1987 as “GLM Inspection Sdn Bhd”. “We were only seven people,” remembers founding member Chandran Thambirajah, now Germanischer Lloyd’s Country Manager for Malaysia. The office may have been small, but it was immensely important as the basis for all further GL activities in Malaysia.

Competence in Technology

“Soon we received government accreditation for testing and certifying gas cylinders,” reports Thambirajah. “Then we began doing approval tests for fire extinguishers,” says Thambirajah. “The next breakthrough was our accreditation for inspecting and certifying pressure vessels and industrial cranes. From then on we experienced strong growth year by year.” The first major order from the oil and gas industry was booked in early 1996. “Our first oil and gas

job was verifying the logistics chain for transporting complete platforms and material to their destinations off the Malaysian coast,” Thambirajah remembers.



PIONEER. Country Manager Chandran Thambirajah.

This order from Exxon Production Malaysia encouraged GL Malaysia to invest substantially in its competence in oil and gas technology. In 1996 Matthias Wessler was dispatched from Hamburg as subsidiary manager. “Our combination of industrial and maritime expertise has enabled us to offer a full range of services to the oil and gas industry,” says Wessler. However, the market differed from Europe – initially there was no demand for plant certification. “It was not mandatory in Malaysia. Our work focused on

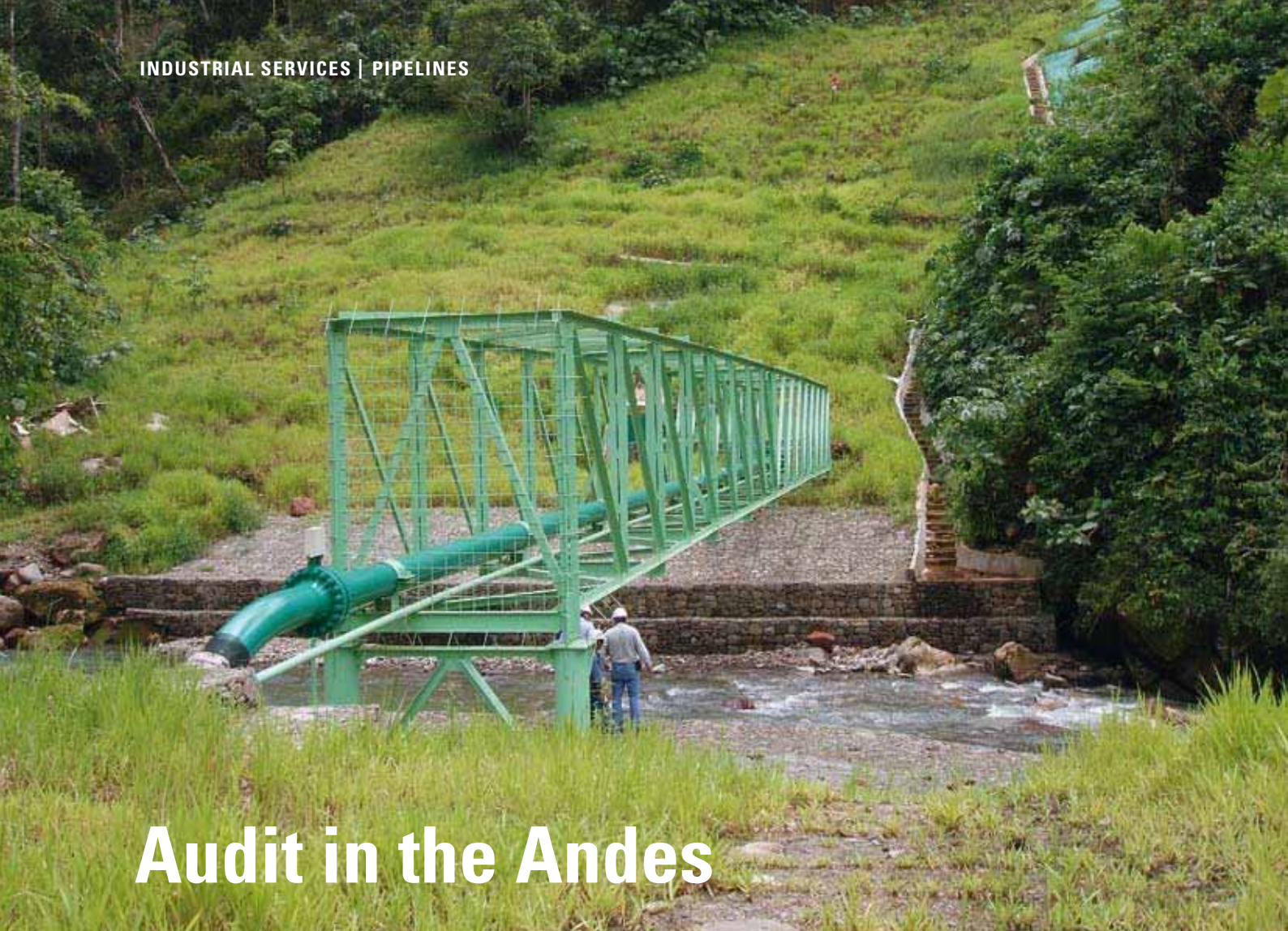
verification, i.e. monitoring design and manufacture. We soon learned that there was also a demand for construction know-how.” That proved to be the right strategy. “Five years later, in early 2001, we were market leaders in the project business in Malaysia,” says Wessler. “Aside from Shell and Petronas who have their own resources, we are now handling nearly all major projects in Malaysia.”

Current top projects include verification and occasionally, certification of new offshore projects run by Carigali Hess Operating Company, Talisman Energy Ltd. and Murphy Oil Co. Orders include verification of compliance with standards during the design phase, monitoring the manufacture of new installations, and taking material samples.

The development of the integrated Asset Integrity Management concept known as GALIOM in 2004, along with the associated software, by GL Malaysia was an important accomplishment for the entire GL group. The GALIOM tool is now in use worldwide, ensuring integrity and enabling value-oriented maintenance using risk-based status evaluation of individual components. “Demand for these services is strong,” says Wessler. “I am especially happy that all GALIOM modules will be deployed at Murphy Oil. This will allow us to demonstrate the potential of this service.” ■ JI



EYECATCHER. The “Petronas-Towers” reflect the economic power of Malaysia.



Audit in the Andes

Deep in the jungle, up to an altitude of 4,800 metres: the San Martin and Cashiriari fields in Camisea are home to one of the most important non-associated natural gas reserves in Latin America. Detecting and avoiding pipeline leaks is a great challenge

The area straddling the Camisea river, located 500 kilometres to the east of the Peruvian capital of Lima, is home to one of the most important non-associated natural gas reserves in Latin America. Discovered in 1983, these reserves are of a retrograde gas condensate type, supported by water drive. The proven volume of original gas in place is 8.7 trillion cubic feet (Tcf), with an estimated ultimate recovery of 6.8 Tcf of natural gas (recovery factor: 78%) and 411 million barrels of associated natural gas liquids (propane, butane and condensate).

The upside potential is estimated to be 11 Tcf of natural gas. “The Camisea reserves are ten times greater than all other existing natural gas reserves in Peru, and are capable of supplying energy to the country for approximately 80 years,” says Thorsten Gundlach, pipeline expert and head of Germanischer Lloyd’s Oil & Gas Sales and Projects Department.

To process the natural gas, a liquid separation plant has been built in Malvinas in the Department of Cusco. In this plant, water is separated from the liquid hydrocarbons contained in the natural gas.

To reach the market, the hydrocarbons are transported from Camisea to the central coast using two parallel pipelines: one for natural gas (NG) and one for natural gas liquids (NGL). From the Malvinas plant, both pipelines

cross the Peruvian Amazon and Andean regions (up to an altitude of 4,800 metres above sea level). “This means that route inspections have to be planned well in advance and must account for the volatile weather conditions,” Gundlach says. The 1.6 billion dollar gas project is backed by the Dallas based company Hunt Oil.

The natural gas and trillion cubic feet transport system (see Info box page 47), in operation since August 2004, has impacted Peru’s growing economy quite dramatically: the pipelines make NG and NGL available for both domes-



VALVE. A pipeline pressure reduction station.

LIFELINE.
The map shows the route of the gas pipeline across the Peruvian Andes.



GAS FLOW. Four pumping stations keep the gas moving.



THE CAMISEA PROJECT

The Camisea natural gas pipeline has a total length of 730 kilometres. From the Peruvian jungle, it crosses the Andean region, reaching altitudes of up to 4,800 metres. It terminates in the city of Lurín south of Lima at the Pacific coast.

The NG pipeline has three sections with different pipe diameters: the first section, 210 kilometres in length, has a 32-inch diameter; the second, 310-kilometre section has a 24-inch diameter; and the third section extends for 210 kilometres and has an 18-inch diameter.

The natural gas liquids pipeline is 560 kilometres long, ending at the Pisco plant. Its two sections are 455 kilometres long with a 14-inch diameter, and 105 kilometres long with a 10.15-inch diameter, respectively.

tic consumption and export. Natural gas now reaches the main consumption centres in Lima. In the capital of Peru the natural gas is used by households, factories and power plants. Electricity generated with natural gas is fed into the country's existing transmission infrastructure for nationwide distribution. Meanwhile, the NGL export market has become a significant source of foreign currency earnings for Peru.

The Weak Spot: NGL Pipelines

Camisea is located in a tropical rainforest in the Peruvian Amazon region. The area is environmentally very sensitive, linking two zones famous for their biodiversity: the Apurimac Reserve to the west and Manu National Park to the east. As a consequence, the five failures that have occurred

in the pipeline systems so far attracted national and international attention from environmentalists, politicians and development experts. All incidents affected the smaller, NGL-carrying pipeline. This failure record, highly unusual for a pipeline system, has prompted the Peruvian Ministry of Energy and Mines to initiate a comprehensive audit of the system.

Germanischer Lloyd has been asked to verify the design and implementation of the Camisea pipeline system for compliance with specifications and international regulations and standards. In addition, the Germanischer Lloyd work group will perform on-site inspections along the line to examine specific points of concern.

"The main focus is on the comprehensive audit to identify what can be done to ensure reliable operation of the Camisea pipelines and to avoid similar problems in future projects," Thorsten Gundlach says. The logistical effort of getting the auditing team to the inspection sites is a real challenge in this project. "Some of the stations to be inspected can only be accessed by helicopter," says Gundlach.

■ CG

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In Touch with the Wind

The prospects for alternative energy sources in Spain are glorious. With energy consumption on the Iberian peninsula on the rise, the need for renewable sources of primary energy is strong

On 20 March 2007, Spanish power network operator Red Elctrica reported a new production record: The day before, 8,375 megawatts (MW) of wind energy had been fed into the power grid. That is 27% of the current energy consumption.

Wind power has a long tradition on the Iberian peninsula: it has been used to propel ships, drive agricultural machines and mills, and more recently, generate electricity. On an international scale, Spain ranks second after Germany in installed wind power. Together both countries account for more than 50% of the total wind energy production in Europe. In 2006, Spanish wind turbines generated nearly 12,000 MW – and the upward trend continues. During the past year alone, Spain installed new units with a total rated power of 1,587 MW (+15.8%). This makes Spain one of the fastest-growing wind power markets, next to the U.S., Germany and India.

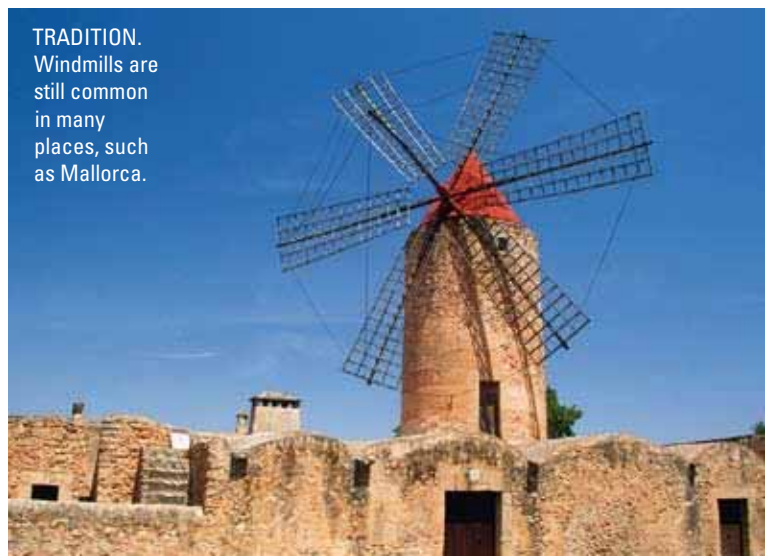
A Symbol of Progress

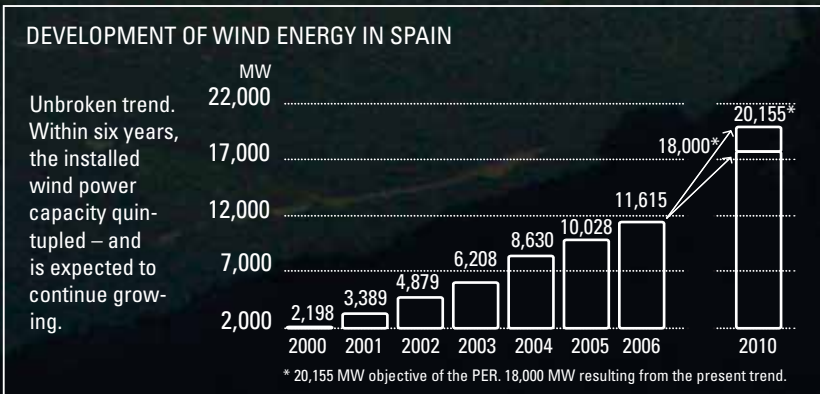
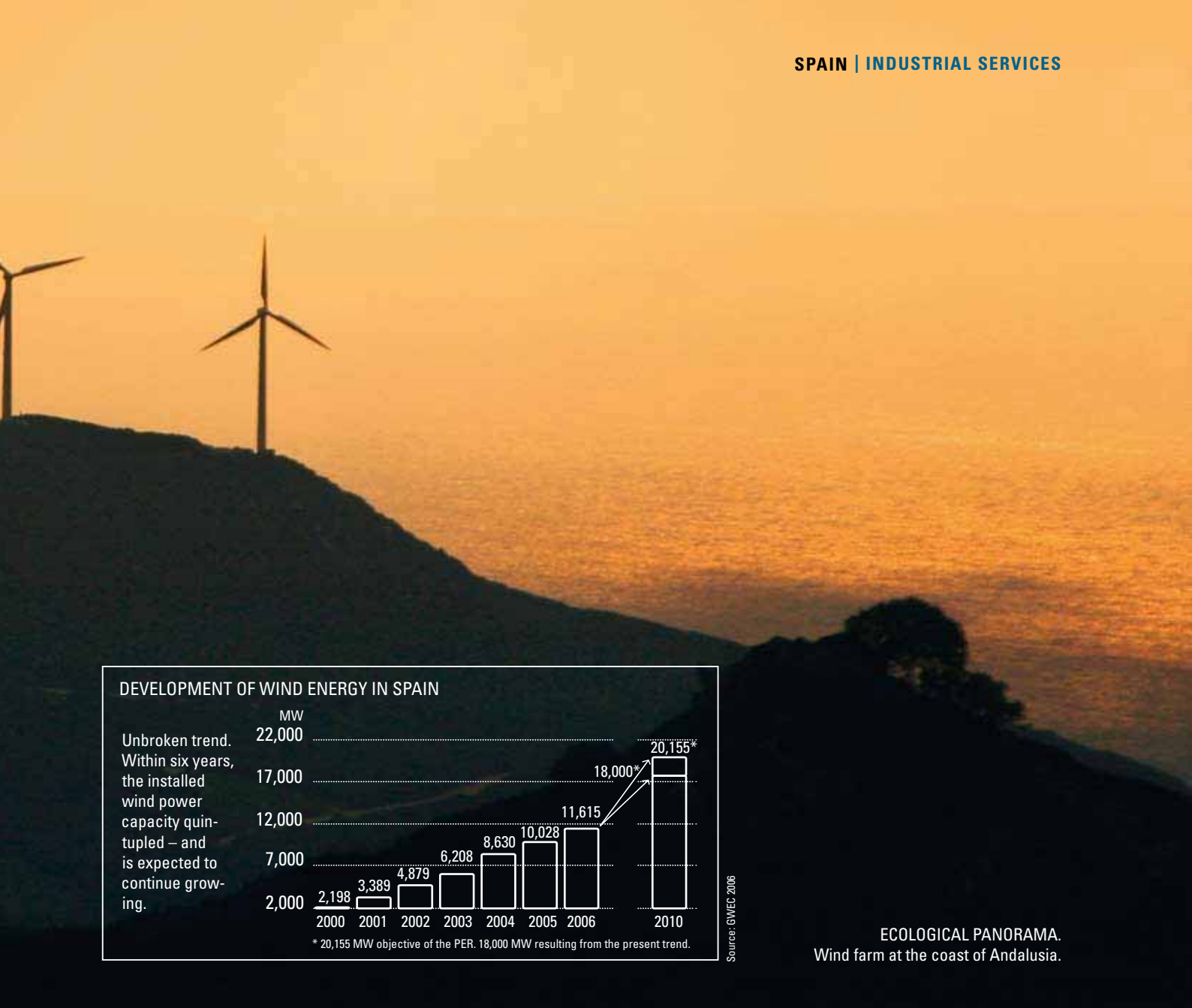
The Spanish government is expecting continued strong growth of its installed wind power base during the coming years. The official Renewable Energy Plan (PER) assumes an increase of 2,000 MW annually and expects to reach the 20,000 MW mark by the year 2010. That would be equivalent to a 12.1% share of renewable energy sources in the nation's primary energy consumption,

and a 30.3% share in the nation's total electricity output. Today, renewable energy covers nearly nine percent of the energy consumption.

The most productive wind power region of Spain is Galicia near the Atlantic coast where the installed base totals 2,603 MW, followed by Castilla-La Mancha with 2,311 MW and Castilla de León with 2,120 MW. Both areas have boosted their wind power generation substantially, surpassing the former champions, Aragón, Navarra and

TRADITION.
Windmills are still common in many places, such as Mallorca.





ECOLOGICAL PANORAMA.
Wind farm at the coast of Andalusia.

Andalusia. Spain boasts outstanding wind power conditions in areas nearly devoid of humans. Most Spaniards do not consider wind farms symbols of environmentalism, nor do they have any misgivings about their aesthetics. People willing to walk in the footsteps of Miguel de Cervantes' satirical hero and fight against windmills are hard to find. In the land of Don Quixote, wind farms are symbols of progress and modernism... and employment. Wind turbines help secure 80,000 jobs, be it directly or indirectly.

Meanwhile, business considerations have shifted the focus towards offshore energy production. 31 offshore projects are currently awaiting approval. The coastal waters off Galicia and Andalusia offer optimal wind conditions. Experts estimate the Spanish offshore wind power potential to total 3,000 MW, or one-fourth of the current inland capacity.

Wind Energy Protects the Climate

The new issue of the PER proposes an energy mix for the years from 2008 to 2020, with a renewable energy share in the electricity production far beyond the 20% demanded by the European Commission. The Spanish government has concluded specific target agreements for electricity generation from 2012 to 2020, resulting in a 32%, and ultimately, a 37% share of renewables in the overall energy

production. Incentives such as public subsidies, government investment and tax benefits attract investment in renewable energy. To date, a major portion of the country's energy consumption has come from fossil fuels, i.e., oil and gas imported from the Gulf region as well as northern and western Africa.

Among the World's Top-Ten

Gamesa Eólica is a leading manufacturer of wind turbines as are Ecotecnia and Acciona. Based in Pamplona, the enterprise and its workforce of 5,400 were able to increase their worldwide market share from 12.9% to 15.6% in 2006. Gamesa Eólica ranks second among the world's top-10 wind-turbine manufacturers, ahead of Enercon and GE Wind. Vestas, the current market leader, has a 28.2% market share.

Gamesa Eólica is represented in 22 countries – wherever the demand for wind power is booming. During the past year, the company installed new units with a total output of over 10,000 MW. Quite obviously, the future prospects are viewed as positive. The company's engineers are currently designing the next-generation Gamesa G10x turbines. ■ SG

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The New GL-Class

TOCA: The revised version of the class transfer procedure makes it easier to change the class – more and more shipowners are making use of it and switching to Germanischer Lloyd



Photo: Dreamstime

CLASS TRANSFER. Greek shipowners show their colours.

The 281,018 dwt VLCC “Tulin” and the 52,500 dwt bulk carrier “Clipper Endeavour” are two of the most recent additions to Germanischer Lloyd’s register, joining a considerable number of Greek-owned bulk carriers, oil and chemical tankers and general cargo ships that have recently changed class to GL.

The latest revision of the Transfer of Class (TOCA) procedure has further simplified the process for shipowners. Designed to be more “tailor-made”, it aims at accelerating the issuance of full term class and statutory certificates. Germanischer Lloyd, in response to calls by shipping com-

panies for a simpler, faster and more efficient transfer of class process, has recently appointed dedicated “TOCA Surveyors” who are selected according to the specific needs of each individual ship (i.e. ship type, survey complexity etc.).

Shipping companies in Greece have discovered the benefits of the new process and are showing growing interest in transferring the classes of their vessels to GL.

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GIANT. The VLCC “Tulin” now operates under GL-Class.



IMO Pilot 2007



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All relevant international legislation for navigation at a glance

Comprehensive reference book plus spark notes: with the "IMO Pilot 2007" Germanischer Lloyd gives an overview on the current legislation of the International Maritime Organization (IMO). The established guidebook offers an overview of all the major changes in technical and operational requirements of IMO conventions (SOLAS, MARPOL, STCW, Load Line, et al.) since the year 2005.

The 7th edition contains, amongst others, the introduction of requirements for protective coating of dedicated ballast water tanks on all new ships and of double-side skin spaces on bulk carriers. Also included: amendments to SOLAS regulation III/19.3.3.4 concerning abandon ship drills with free-fall lifeboats in order to prevent accidents during training. These regulations will enter into force on 1 July 2008 together with numerous amendments to the International Life-Saving Appliance Code (LSA Code).

"IMO Pilot 2007" lists the changes to SOLAS chapters II-1 and II-2, which reflect new concepts for the safety of passenger ships and come into force on 1 July 2010. New regulations regarding fire safety of cabin balconies also affect the International Code for Fire Safety Systems (FSS Code).

A major MARPOL regulation (I/12A) introduces requirements for fuel tank protection to minimize oil outflow in case of collision or grounding.

Up-to-date and capacious: the new "IMO Pilot 2007" is an essential and handy reference for yards, owners, shipping companies and flag state administrations alike.



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