Germanischer Lloyd

nonstop

The Magazine for Customers and Business Partners

EDITION 2 · 2006

Greek Shipping

Big Appetite

COLD IRONING Get Connected
ASIA The Good Spirit of Sanya
INNOVATION IN THE SEA Producing Oil in Gruelling Conditions

The secret of a long life

How GL can help your tankers last longer

When it comes to tankers, there's no better or more technically qualified address than Germanischer Lloyd. Our extensive know-how can help improve the operational safety and profitability of your tankers. We look forward to hearing from you.

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Germanischer Lloyd
OPERATING 24/7

Dear Readers,

Rainer Schöndube

How fitting for the Costamare presentation at the largest and most important shipping show in the Mediterranean region, the Posidonia in Athens – the shipping company can now boast the largest container ships in the world! Since spring, one giant after the next has been delivered this year. The "big five" family will soon be complete. Following in the wake of the COSCO Ningbo, COSCO Guangzhou and COSCO Yantian, two more mega-carriers will be delivered in June and July by Hyundai Heavy Industries. These ships offer a stowage capacity of 9,500 standard containers (TEU), and are 350 m long and 42.80 m wide. With these gargantuan measurements, they have wrested the title of biggest container ship from the "MSC Pamela", which entered line service with 9,200 TEU last summer.

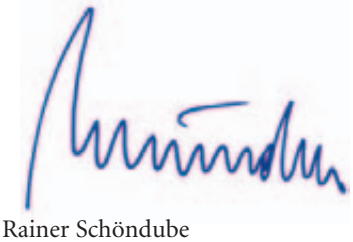
Originally, each of the five ships was intended to carry "only" 8,200 TEU. At the end of 2004, the loading capacity was increased by 1,300 TEU in order to meet the current demand for ship tonnage more effectively. Costamare is one of the first clients to have built jumbo post-Panmax ships with Germanischer Lloyd. Once before in the past – at the Posidonia 1998 – the planned stowage capacity had also been increased at short notice, thus creating a new type of container carrier.

Oil tankers and bulk carriers are still the leading ship types in the Greek fleet. However, the proportion of container ships is growing, due in no small measure to the efforts of Costamare. In exclusive interviews with our customers, we present three Hellenic success stories. Reason enough to make Greece the keynote theme for this issue of nonstop.

The services provided by our "Industrial Services" are in demand not only in the Mediterranean region, but also much farther north. Russia's most important oil and gas reserves are located on Sakhalin. Two classified production platforms are being erected there, with fabrication in South Korea monitored by surveyors of the Oil and Gas business area.

In which latitudes may we employ our expertise to your benefit?

Yours sincerely,



Rainer Schöndube
Member of the Executive Board

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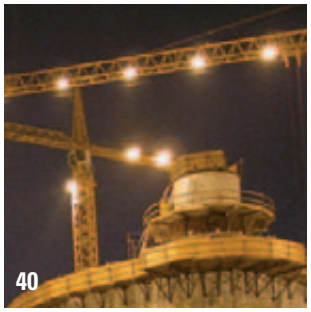

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News from Maritime Services

Hergen Thielemann, Division Manager East Asia Germanischer Lloyd, and Capt. Wei Jiafu, Cosco Group President (from left to right)

ON THE TOP

"COSCO Ningbo" is the biggest

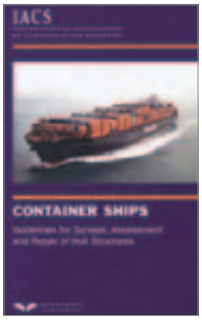
350 m in length, 42.8 m in width, 14.5 m in design draught and a loading capacity of 9,500 TEU! Those are the technical facts of the world's largest container vessel, the "COSCO Ningbo" which was built by Hyundai Heavy Industries in Korea, classed by GL, owned by Costamare and chartered by COSCO. Captain Wei Jiafu, president of COSCO Group, and Costamare's Mr. Costis V. Constantakopoulos participated in the christening of the "COSCO Ningbo" in March 2006. Hergen Thielemann, Division Manager East Asia and Werner Enning, Area Manager China enjoyed the christening ceremony in the port of Ningbo along with 400 guests as Mr Xu Lirong, Managing Director of COSCON; the Vice Governor of the Zhejiang Province; the Vice Mayor of Ningbo city and the General Manager of the Ningbo Port Group.

LOAD LINES CONVENTION

Mixed effects from revised freeboard rules

The overall impact of the revised Load Lines Convention on container ships has been less severe than expected. However, the experience over the last 15 months, since the revision became effective, shows that the tightened rules can have significant implications for designs of handy container vessels. Germanischer Lloyd has come across cases in which existing series of ships built under the old load line regime could not be continued without several changes to the design. It is a particular problem for small and slender ships designed for minimum freeboard. Their freeboard will have to be recalculated if they do not comply with the increased minimum bow height or if the required reserve buoyancy is lacking. However, the need for alterations to the design will be partly offset by the new suprastructure correction. Interestingly enough there are other cases in which existing ships even gained extra draught under the revised Load Lines Convention. A container feeder of 130 metres in length and 890 TEU capacity with a Cb value of 0.67, for example, was granted 379 mm more draught. It benefited in particular from a more favourable suprastructure correction and a reduced bow height requirement. Owners are advised to contact Germanischer Lloyd at an early stage in order to detect possible design difficulties and to identify corresponding solutions.

For further information: Lutz Laubenstein, Load Line and Tonnage, Phone: +49 40 36149-3797, lutz.laubenstein@gl-group.com



IACS Guidance Manual

IACS has produced an extensive guidance manual to assist class surveyors, owners, operators and regulatory bodies involved in the survey, assessment and repair of container ship hulls. The manual relates to single-deck container ships with doubleside-skin tanks, passageways and doublebottom cargo spaces. The book draws on data gathered with the help of the IACS Early Warning Scheme (EWS) for the reporting of hull failure incidents. The principal purpose of the EWS is to enable classification societies that have knowledge of hull failure incidents to make their information available to all other IACS members.

"Container Ships: Guidelines for Surveys, Assessment and Repair of Hull Structures" (ISBN-10: 1856092968): Witherby & Co. Ltd, 32–36 Aylesbury Street, London EC1R OET, UK, phone: +4420 7251 5341, fax: +4420 72511296, e-mail: books@witherbys.co.uk

Taking a deep look: Robert Surma (GL), piping specialist Seppo Lindroos (OY Tarw-Trading) and pilot Asko Laite (OY Tarw-Trading)

SUBMERSIBLES

Sea Trial: Maximum Diving Depth Achieved?

A few sea miles west of the island of Åland between Sweden and Finland, GL submersibles expert Dr Robert Surma sought to answer this question in April. All systems of the submarine newbuilding SM300/3 made by the Finnish company OY Tarw-Trading Ltd were examined for their functional readiness with a complete crew of three persons at the maximum diving depth. The depth actually attained was 286 metres, which according to the Managing Director of OY Tarw-Trading Ltd, Tapio Malmgren, was a depth that had not yet been reached off the coast of Finland. The civilian submarine does not have the classic cigar shape – its unusual form is reminiscent of a James Bond movie. The spherical vehicle with the large viewing window will be used by the owner, Cantieri Navali Megaride, in the Gulf of Naples, for research and explratory missions – namely in searching for remains of the ancient city of Pompeii. According to the classification and construction rules of Germanischer Lloyd, it is necessary to perform a dive down to the maximum permissible diving depth. Test passed, crew relieved!

For further information: Dr. Robert Surma, Pressure Vessels / Underwater Technology, Tel.: +49 40 36149-7917, robert.suma@gl-group.com

THE SEATRADE AWARDS IN LONDON

Congratulations to Epaminondas Embiricos

Epaminondas Embiricos, Chairman of the Greek Shipping Cooperation Committee, was named Seatrade Personality for 2006 at the Seatrade Awards dinner in London in mid-April. He was cited for his outstanding representation of the London Greek community in the City of London and his strong advocacy of a range of issues in particular his late opposition to EU Directive on Criminal Sanctions for Ship Source Pollution. He is an outspoken critic of unilateral action. In the eighth Cadwallader Memorial Lecture he gave a presentation on "The Extra-Territorial Jurisdiction in Criminalisation Cases: Sovereign Rights in Legislation and New Risks for the Shipping Industry" in which he pointed out that "unilateral EU action cannot hope to improve an international regime, nor create a level playing field, in an international industry such as shipping, where vessels, of all nationalities, trade all over the world." His profound analysis concludes: "We should also be concerned that the directive undermines the IMO, by unilaterally introducing a regime in the EU, which is in breach of the MARPOL Convention. This constitutes a great disservice to the Shipping Industry and thus to world trade and the world economy. Shipping, which operates in the four corners of the world, can only function properly if its regulation is agreed to internationally, through the auspices of the IMO, rather than regionally and/or unilaterally. It must be recognized that undermining the IMO is tantamount to undermining safety at sea and the protection of the environment". The 18th annual Seatrade Award ceremony took place in the Banqueting House, which is the last surviving fragment of the historic Palace of Whitehall. It was here that the unfortunate King Charles I lost his head in 1649. Eleven years later, in a dramatic contrast, his son Charles II restored to the throne arrived in magnificent procession to be greeted by Parliament. Together with a group of hand selected clients, Harald Seibicke, Area Manager Benelux/Northwest Europe enjoyed a pleasant evening acknowledging the importance of significant technical or procedural improvements in shipping.

America's Cup: Rigged for Victory

The leading lady of the first German campaign in the prestigious America's Cup is called "Germany I". This was the name given to the new boat of the United Internet Team Germany by Eva Luise Köhler, wife of Federal President Horst Köhler, on 24 April in Kiel. Over 25,000 building hours and as many design hours had been invested in "Germany I", which measures 26 metres in length and 4 metres in width. Extensive analyses using computational fluid dynamics (CFD), velocity predictions (VPP) and structural calculations with the design computers were needed for its fabrication. Thanks to modern construction methods, the hull, mast, fittings and equipment only weigh a little more than four tonnes – almost 20 tonnes of the maximum permissible weight of 24 tonnes are applied as ballast in the bulbous keel, with a draught of 4.10 metres. The mast, which has to weigh at least 750 kilograms, then extends about 33 metres into the sky. The boat's structure was calculated by rig designer Hasso Hoffmeister, Head of the "EU Certification of Recreation Craft" Departmentat Germanischer Lloyd in Hamburg. The 32nd America's Cup will take place in the summer of 2007 in Valencia, Spain.

SHIP LAUNCHED

Hartmann Reederei on Expansion Course

The shipping company Hartmann Reederei in Leer is a leader in awarding contracts to German yards. Over the past 18 months, the firm has had no less than eleven ships built in Germany. The youngest member of the fleet was recently launched at Aker in Wismar. This double-hulled container ship has a length of 207.4 metres and a breadth of 29.8 metres. With a deadweight tonnage of some 27,400 dwt and a gross tonnage of 25,406 GT, the container stowage capacity is 2,478 TEU. In future, the ship will bear the charter name "Itajai Express" and sail under the Liberian flag for Hapag-Lloyd in line traffic between Europe and South America. Eight sister ships of the type Baltic CS 2500 are already in service; this unit was originally named the "Frisia Hannover". Besides gas tankers and container ships, the fleet of the Hartmann Reederei includes multi-purpose, bulk and special carriers in the dry-cargo trade. Further reinforcements are already planned: four container ships and four gas tankers are due to be commissioned this year.

The sponsor was Irene Klein, wife of Dr. Hermann J. Klein, GL Executive Board Member

BRAZILIAN INITIATIVE

Putting an End to Dangerous Cargo in the Ballast Water

Things are getting uncomfortable for the Chinese mitten crab. But viruses, bacteria, fungi, algae and plankton as well as small fishes, mussels, starfish and crabs will also no longer be able to take a comfortable ocean cruise. In a long-term study performed in the nineties, over 4,000 different invasive species were counted in the ballast water of ships. Many states have reacted to the ecological threat by passing their own national regulations to protect the ocean fauna and are supporting the efforts of the IMO to implement the Ballast Water Management Convention. Brazil has positioned itself as a trailblazer of solo national initiatives. Since mid-October 2005, the South American state has been demanding that seagoing ships present adequate proof of a prior exchange of ballast water. 24 hours before the vessel reaches Brazilian territorial waters, the ballast water exchange must have been documented and the evidence sent to the local port authorities. An approved Ballast Water Management Plan must be available on board Brazil traders by 1 July 2006 at the latest. The ratification process for the "International Convention for the Control and Management of Ships' Ballast Water and Sediments" is already in full swing. Argentina, Australia, Brazil, Finland and the Netherlands have signed the convention. It has already been ratified by the Maldives, Nigeria, Saint Kitts and Nevis, Spain, Syria and Tuvalu, which together represent about 0.6 percent of the world tonnage. In order that the Convention can come into force, however, it must have been ratified by at least thirty states representing over 35 percent of the world merchant shipping tonnage. The members of the Cyprus Shipping Council were informed by Hendrik Bruhns, Head of the Stability Department in the middle of April in Limassol about the current state of technical effectiveness exhibited by ballast water management systems, the national regulations of Canada, the USA and Brazil, the deliberations of the European Union, and the operative challenges facing the shipowners today. With due consideration of the expected technical requirements, he recommended that sufficient space be reserved in the engine room for future ballast water treatment systems when planning ship newbuildings.

And the award goes to …

German container ship owner Hamburg Südamerikanische Dampfschifffahrts-Gesellschaft (Hamburg Süd) is the winner of Containerisation International's "Regional Carrier" award, which was sponsored by classification society Germanischer Lloyd. Hamburg Süd's Francis E. Larkin received the award from Fritz Grannemann, Head of Germanischer Lloyd's Americas Division. The award celebrates the 50th anniversary of the container shipping industry and were presented in New York.

PRIZE-GIVING. John Fossey, Editor in Chief, Containerisation International; Francis E. Larkin, Senior Vice President, Hamburg Süd; Fritz Grannemann, head of Germanischer Lloyd's Americas Division; presenter Jim Angle, Fox News (left to right).

50 vessels are just the beginning

A 1,740 TEU container vessel is the 50th ship being built with Germanischer Lloyd class at Guangzhou Wengchong Shipyard Co. Ltd. A contract for an additional four container vessels was signed by Xu Guoqing, Guangzhou Wengchong Shipyard, and Hergen Thielemann, Division Manager East Asia of Germanischer Lloyd in March 2006. Two of the five new ships have been ordered by German owner Leonhardt & Blumberg, two by Thien & Heyenga and one by St. Donatus Shipping. More than 80 guests - including representatives from GWS, Guangzhou Shipbuilding International Corp. and Guangzhou Huangpu Shipyard – joined the contract signing. The relationship between Guangzhou Wengchong Shipyard Co. Ltd. and Germanischer Lloyd began in 1996 when the steel cutting for the very first 1,200 TEU containership took place. The delivery rate of Guangzhou Wengchong Shipyard has improved rapidly from two vessels per year in 1997 to eight vessels in 2005. Today the shipyard has orders for 24 vessels with altogether 370,032 GT which are due for delivery by 2008. The steel cutting for the 50th vessel will take place on 18 November 2007. Delivery is expected to be 15 October 2008.

BALTIC SEA

First Sulphur Oxide Emission Control Area imposed

The deadline has already passed. On 19 May the Baltic Sea was declared a Sulphur Oxide Emission Control Area (SECA). As a part of a step-by-step approach, MARPOL Annex VI, which came into force one year ago, calls for a gradual reduction in fuel sulphur levels. In the case of the Baltic Sea, ship operators are requested to limit the sulphur content of fuel oil to 1-.5% m/m. Depending on the type of vessel, its tank and engine set up, a number of technical difficulties may need to be resolved. One aspect is the changeover from one fuel quality to the other, which is necessary every time a ship enters or leaves a SECA. The requirements have to be fulfilled from the moment a vessel crosses into a SECA. It may take up to 120 hours or more for the changeover to be completed. In addition, great care must be taken to minimise the risk of damage to the engine. Regular heavy fuel oil, which has relatively high sulphur content, and fuel oils with sulphur content below 1.5% should ideally be combined with different types of cylinder lubricants. Inappropriate combinations of fuels and lubricants as well as fuel incompatibilities – ships entering or leaving a SECA may not always have the ideal lubricant available – have to be monitored closely. Under new EU rules, which are even more demanding, the maximum permitted sulphur content of fuel oils used on board ships in EU ports or on EU inland waterways will be 0.1%. This limit is due to be enforced from 1 January 2010. Apart from limiting the sulphur content of fuel oils, Annex VI severely restricts the use of ozone-depleting chemicals, prohibiting deliberate emissions of substances such as halons and chlorofluorocarbons (CFCs). Likewise, new installations containing ozone depleting substances are prohibited on all ships. However, new installations containing hydrochlorofluorocarbons (HCFCs) will be permitted until 1 January 2020. The establishment of SECAs makes considerable demands on operators: crews need to be well trained and vessels need to be equipped for the use of two types of fuels and lubricants. While newbuildings are designed to accommodate the new requirements, existing ships may need to be modified. The second European SECA zone will be brought into force on 11 August 2007 and will have similar low sulphur levels in the North Sea and English Channal. The EU is considering additional SECAs in the Mediterranean Sea and the Bay of Biscay. There are tentative plans to introduce SECAs around the US coastline, off California and the eastern seaboard. In Asia SECAs could be introduced in Tokyo Bay, Hong Kong, Singapore and the Malacca Strait.

Trade Fairs

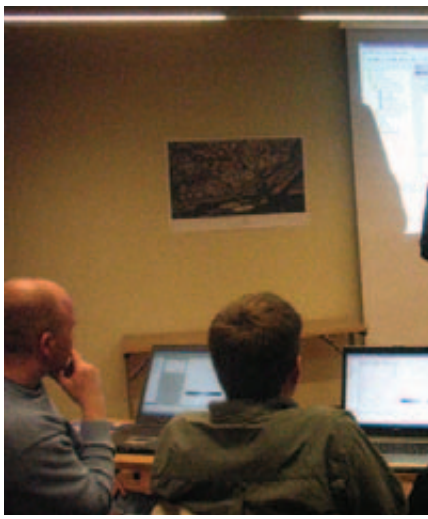
JUNE

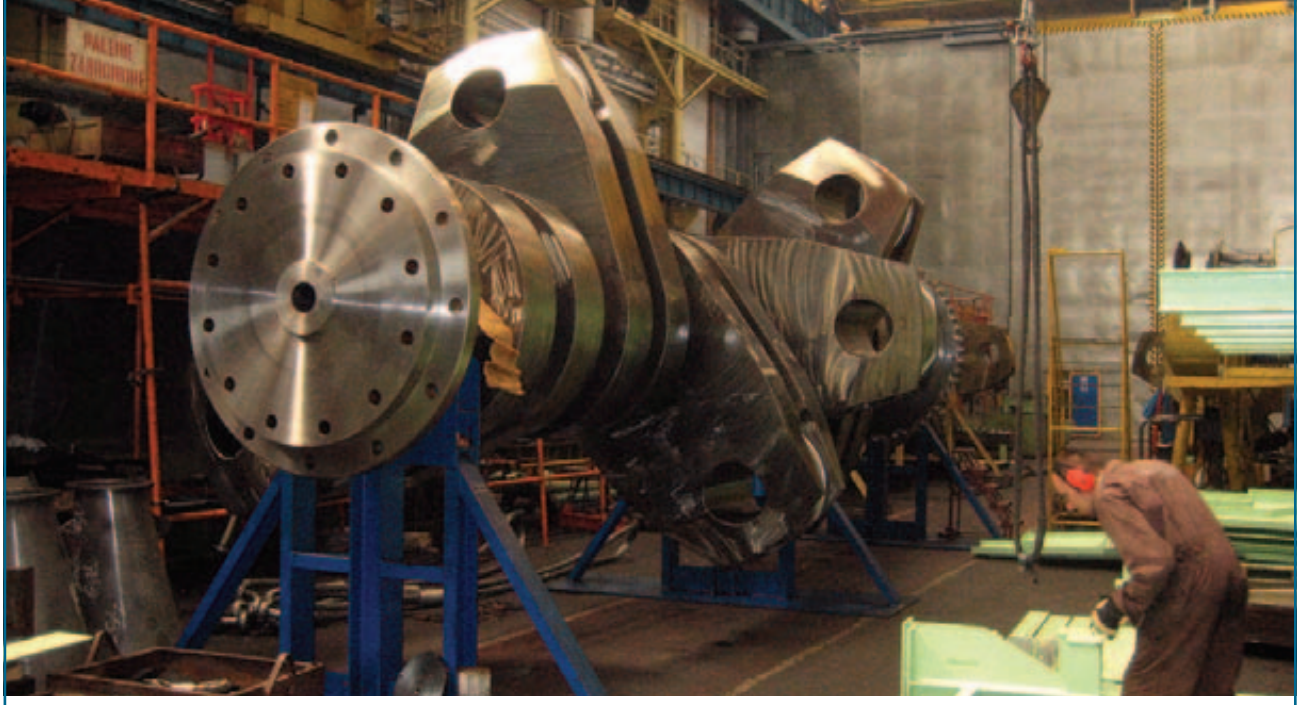
05.06. - 09.06.2006, Piraeus
Posidonia 2022
www.posidonia-events.com

27.06. - 29.06.2006, Hamburg
UDT Europe 191 CCH
www.udt-europe.com

SEPTEMBER

26.09. - 29.09.2006, Hamburg
SMM 15012 EG
www.hamburg-messe.de/smm





POZNAN

Polish Committee Meets at H. Cegielski

By invitation of the management, the Polish Committee met at the H. Cegielski engine works for its annual meeting. The time and venue of the 11th meeting, which took place in April, were well chosen: H. Cegielski can look back at a long and proud engineering tradition and is celebrating its 160th jubilee this year. The cooperation between H. Cegielski and Germanischer Lloyd has existed for over 30 years. Tests on Sulzer engines of the type RTA62U were already carried out in 2000 with the aim of reducing the NOx emissions, and Interim Engine Air Pollution Prevention certificates were issued. Particularly in recent years, the reduction in the fuel sulphur content demanded by MARPOL Annex VI has led to an intensive exchange of experience. Since then, the efforts aimed at ensuring reduced emissions of marine engines in compliance with the statutory provisions valid since May 2005 have been progressing continuously. Consequently, the committee members concerned themselves with technical and operative questions of how the statutory requirements for the quality of the fuel can best be met in both SECA and non-SECA zones. Dr Reinhard Krapp, Deputy Head of the Competence Centre "Strategic Research and Innovation Management" at Germanischer Lloyd, spoke about the future restrictions on the sulphur content in fuels and their effects on ship operations. Latest experience gained with slow-running two-stroke diesels with a low sulphur content in the fuel was presented by Waclaw Przewozny from H. Cegielski, who also conducted the subsequent tour of the works. The presentation given by Dr Pierre Sames, Head of the Competence Centre "Strategic Research and Innovation Management", on the EU research project entitled "Design, Operation and Regulation for Safety" (SAFEDOR) met with great interest in view of the increased freedom afforded to ship design and shipping by a new safety philosophy in naval architecture. On the previous evening, Tadeusz Nalewajko had been honoured with the GL pin in silver for his tireless efforts over ten years of service as a surveyor. In a short speech, Area Manager Uwe Diepenbroek paid tribute to his excellent work. What is more, it seems that his commitment for Germanischer Lloyd runs in the family: for several years now, his competent daughter Agata has been working for Germanischer Lloyd Certification; amongst other activities, she audits the quality management and occupational safety systems (ISO 9001, ISO 14001 and OHSAS 18001) of the H. Cegielski engine works.

FINLAND

POSEIDON Seminar

At the beginning of April, the first POSEIDON training seminar took place in Turku; the event was attended by development engineers from yards and design offices, as well as by lecturers from the technical universities of Helsinki and Turku. Introduced in 1997 and continuously advanced since then, the universal ship and steel design program for efficient dimensioning of the hull structures for all ship types met with a positive response from the participants, not least because of its straightforward user interface and general ease of use. Michael Hesse, naval architect in the Department NHP and main expert for the POSEIDON Hotline, explained how POSEIDON can be used to perform first-principle calculations of cargo hold models, local models or the entire hull structure with the aid of the finite element method. For ships that were dimensioned with POSEIDON, the results of the thickness measurements can be entered within the scope of a class renewal, for example, so that a strength evaluation can be performed with less effort. After POSEIDON has been programmed to the new requirements of the Common Structural Rules for tankers and bulk carriers, the software will be available for the calculation of new ship designs.

SEATRADE MIAMI

Joint workshop on safety matters

Andreas Ullrich, Burkhard Müller and Wolfgang Menzel (left to right)

"Challenges in the Lifecycle of Passenger Ships" was the title of a workshop organized by Germanischer Lloyd and AIDA Cruises at this year's Seatrade Cruise Shipping fair in Miami, USA. Fire protection and escape routes, global strength and damage stability were among the topics presented to the audience of industry representatives and journalists by Andreas Ullrich, GL's ship type manager for passenger ships and cruise vessels. He outlined the contributions of classification to the complex technical challenges a cruise ship poses. Meeting international safety requirements and optimising the demanding features to make a passenger ship not only technically sound but also an economic success is one of the many tasks. "The more detailed the ship specifications, the easier it gets later. This is where you need the professional input," is how AIDA Cruises' VP Fleet Services Burkhard Müller underlined the advantages of working with Germanischer Lloyd long before the first steel is cut. The AIDAdiva, currently under construction at the German shipyard Meyer Werft, will be the latest addition to the AIDA fleet of cruise vessels. The ships will feature a "theatrium" – a combination of theatre and atrium – and fully redundant propulsion, both aspects requiring extensive strength and power calculations. How the cruising comfort can be enhanced already in the project phase was outlined by Wolfgang Menzel, head of the department for experimental investigation at GL's head office in Hamburg. His comments on advanced noise and vibration calculations turned the attention to how emission sources can be identified at a very early stage in the genesis of a ship. On the basis of the submitted viable solutions, specifications can be met exactly and cost intensive corrections at a later stage can be avoided.

For further information: Andreas Ullrich, Ship Safety, Deputy Head of Department, Phone: +49 40 36149-454, andreas.ullrich@gl-group.com
info@aida.de, www.aida.de

Asia Pacific Maritime

During the Asia Pacific Maritime (APM) 2006 which was recently held in Singapore Mrs Lim Hwee Hua, Minister of State for Transport and Finance (in the middle) visited the booth of Germanischer Lloyd together with Dr. Joerg Mutschler, Managing Director of German Marine and Offshore Equipment Industries (second from left) and Mr. Michael Chia, President of Association of Singapore Marine Industries (ASMI) (fifth from left). Y C Lam, Commercial Manager Division East Asia briefed the minister on the activities of the classification society Germanischer Lloyd.

Container lashing

Germanischer Lloyd gave a report to more than 70 shipping lines and ship-owners regarding current tests of all sea container storage systems on container ships. Lutz Müller, Head of the Ship Technology Department, reiterated the information gathered from previous cases of loss and damage, explained the facts surrounding current cases of cargo losses on container ships and the previous approval procedure for twistlocks and fully automatic locks, in which each piece of securing equipment is tested for function and durability. During an investigation into the causes of an event of this type, the aforementioned factors carry as much weight as any possible inaccuracies in construction of the containers, the degree of wear on the container corner fittings for older steel boxes as well as correct execution of the lashing procedure as prescribed in the Cargo Securing Manual. Those facts show exactly the reconstruction of errors, which occurred, so as to formulate suggestions for improvement in ship operations. Helge Rathje, Head of Hydromechanics, explained to the participants how extensive pressure analyses can be performed using Computational Fluid Dynamic Analysis, and what results can be expected in relation to pressure distribution and the air-water threshold. Ship Type Manager Container Ships, Jan-Olaf Probst, talked about the results of the combined material and function tests.

For further information: Lutz Müller, Head of the Ship Technology Department,
Phone: +49 40 36149-391, lutz-mueller@gl-group.com

AIDA / MEYER WERFT / GL

"Now We Need to Even the Score"

This was the comment by Christian Schönrock, Head of the Newbuilding Team at AIDA and organizer of the AIDAdiva Sailing Race, on the final result: with one win and three second places in four races, the shipbuilders at Meyer shipyard relegated Germanischer Lloyd and Aida Cruises to second and third place. The teams of the companies involved in the construction of the three new AIDA ships battled against each other on the Baltic off Warnemünde. "We wanted to intensify the personal contacts beyond the level of everyday work," is how Schönrock described the underlying purpose of the regatta with the Volvo Ocean Racers "Rostocker", "TSystems" and "aROSA". Although the teams had not been put together with a view to their sailing abilities, yard owner Bernard Meyer had already seemed confident of victory before the start. "We're simply not going to lose." And was also proven right in the end. But wait until next time.

GL Academy

JUNE

06.06.2006, Hamburg
Introduction to the Human Factor & Reliability in Design, Production and Maintenance for Management Personnel

07.06.2006, Hamburg
ISPS for Shipyards

22.06.2006, Hamburg
Managing Newbuildings

27.06. - 28.06.2006, Hamburg
Differences to the EN/AS/JISQ 9100 Series for Aerospace Design, Development, Production, Installation and Service Organizations

29.-30.06.2006, Hamburg
Shipping Basics

JULY

04.07.2006, Hamburg
Introduction to Configuration Management for the Aviation Industry in accordance with ISO 10007

06.07.2006, Hamburg
Introduction to Business and Technical Risk Analysis using FMEA/MSG-3 and RCA Methods for Management Personnel

18.-19.07.2006, Bremen
Company/Ship Security Officer Training Course

19.07.2006, Hamburg
Introduction to the System of Maritime Regulations

20.07.2006, Hamburg
Inspections, Surveys and Certificates

26.07.2006, Hamburg
ISM Basics

27.07.2006, Hamburg
ISPS Basics

AUGUST

16.-17.08.2006, Hamburg
Internal Auditor ISM / DIN EN ISO 9001:2000 for Shipping Companies

30.08.2006, Hamburg
STCW Basics

31.08.2006, Hamburg
Introduction to Crewing

SEPTEMBER

04.09.2006, Hamburg
Emergency Preparedness and Crisis Management

05.09.2006, Hamburg
Customer Satisfaction

12.09.2006, Hamburg
Bridge Design, Equipment and Arrangement

12.09.2006, Hamburg
Shipping Basics for Banks

13.09.2006, Hamburg
Practical Aspects of Corrosion Protection for Shipping Companies and Shipyards

14.09.2006, Hamburg
Bulk Carriers – Technical and Operational Aspects

19.09.2006, Hamburg
Basics about DIN EN ISO 9001 for Shipping Companies

19. - 20.09.2006, Hamburg
Differences to the EN/AS/JISQ 9100 Series for Aerospace Design, Development, Production, Installation and Service Organizations

21.09.2006, Hamburg
ISPS Exercise

26.09.2006, Hamburg
Basics about DIN EN ISO 9001 for Industry and Service Providers

26.09.2006, Hamburg
Introduction to the Requirements of the Aerospace EN 9100 Series for Design, Production, Maintenance and Parts Supplier Organizations including Authority Requirements

27. - 28.09.2006, Hamburg
Internal Auditor DIN EN ISO 9001 for Industry and Service Providers

For further information: GL Academy, Phone: +49 40 36149-195, academy@gl-group.com, Internet: www.gl-group.com > Maritime Services > GL Academy

Big appet

The maritime sector share of the Greek economy has once again exceeded the contribution of the tourist industry. Vessels are getting bigger and younger. A quality revolution in Greek shipping has shown remarkable success in recent years. Greek owners benefit from the rising demand in tanker and bulker shipping. Options for further investments are plentiful.

Shipping, a jewel in the crown of the Greek Economy

Modernisation needs capital. In this regard, the Greek shipping industry has the best premises. Greek-owners control 25 percent of the global tanker fleet on a tonnage basis, making the fleet the world's largest. Over the last decade the Greek owned tanker fleet has expanded by 50 percent while the worldwide tanker fleet as a whole expanded by only 9 percent.

But not only the world tanker tonnage is mainly attributable to Greek shipowners, but also the bulker tonnage. Latest figures from the Institute of Shipping Economics and Logistics (ISL) in Bremen from July 2005 show, that Greece is first of the top ten countries in terms of tonnage followed by Japan and Germany. The over 600 shipping companies registered in Greece amount to more than 100 million GT.

Revenues from shipping are even more important to the country's current account balance than from tourism and Greece is presumably one of the very few countries that has a dedicated Ministry for Marine Affairs.

With their core business being bulkers and tankers, the Greek shipping industry has been able to benefit very much from the positive developments of the trade with dry and liquid bulk in recent years. There has been a rapid growth of the commodities grain, coal, iron ore, phosphate rock and bauxite and alumina, which are major bulk. Between 1981 and 2003 the total major dry bulk shipments increased from 0.9 to 1.5 billion tonnes. The seaborne trade of liquid bulks, mostly oil, increased from some 1600 million tonnes in 2002 to 2265 million tonnes in 2004.

Further, many of the country's shipping companies recently hit the stock markets, mostly New York. They no longer keep the tradition of the family owned business. Successfully. High freight rates have bestowed unprecedented valuations on the stocks.

Dr Hermann J. Klein, member of the Germanischer Lloyd Executive Board welcomes the Chairman of the Union of Greek Shipowners Mr Efthymiou to a GL Hellas reception

THE GREEK FLEET

3,397 ships with 113.5 mn. GT are controlled by Greek interests
364 ships with 15.6 GT are on order at shipyards worldwide
Greek interests control 16.1 % of the worldwide dwt
Greeks remain first in oil tanker tonnage (21.1% of world dwt) and bulk carriers (22.1% of world dwt)

Source: Greek Shipping Co-operation Committee, March 2006

Following the path

The pace of new orderings is slowing down. The year 2005 was the first Greek owners did not expand their controlled tonnage – not only due to high prices and lengthy delivery periods. It is also striking that only 46 new tankers were ordered, mostly small product and chemical tankers. That is the lowest number in five years. But the heads of the industry see no shift away from the path of modernisation. They say it is just a question of time. The appetite is still there. Once the prices fall, they all want to extend their fleets – with newbuildings or young second-hand vessels. Any moreover, entering 2006, the Greek order book was still filled with more than 200 tankers of various types, as well as 23 gas carriers.

The gas carriers in the order books indicate an interesting development in the Greek market. Gas shipping, both LNG and LPG, is becoming a new important segment. Only a year ago, there were 61 liquid gas vessels, now they amount to 93.

Free market wanted

A most important shipping sector for Greece with its thousands of islands and millions of tourists is the ferry business. In 2005, 100 million and more people moved through Greek ports, the largest number of any country in the European Union. Further, Piraeus was the European Union's busiest port with nearly 0 million people. Still, investment in newbuildings is relatively rare for the time being. Operators mainly argue that the regulated prices for the economy class work against investment. Only the business class as a "free market class" was not enough. Discussions between operators and the government are in progress.

Risk a move closer

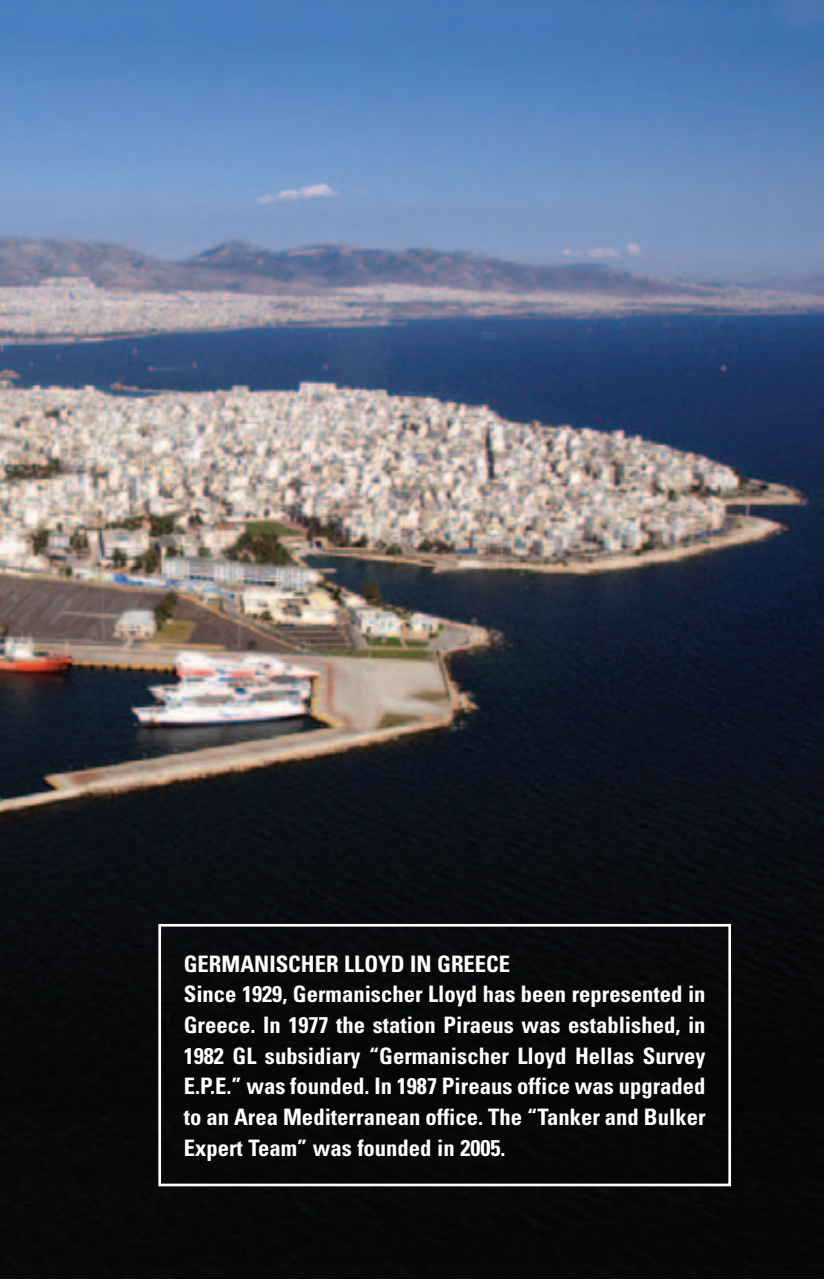
Greece has been a seafareing nation since ancient times. Therefore, it was logical for Germanischer Lloyd to offer its services also in Greece. In 1929, Gregory Parissis was the first representative of Germanischer Lloyd in Greece. The station Piraeus was established in 1977, the foundation of the GL subsidiary "Germanischer Lloyd Hellas Survey E.P.E." took place in 1982. In 1987 the Pireaus office was upgraded to an Area Mediterranean office. "Today, GL has 170 ships of Greek owners under attendance; this corresponds to about seven percent of the GL global turnover with the fleet in service," says Area Manager Athanasios Reisopoulos. The list of clients includes names such as Costamare, Laskaridis, Minoan Lines, Hellenic Seaways and many more. Class "GL" is in demand especially for multi-purpose and container ships, whilst in the passenger ship sector it enjoys a strong position.

"But Germanischer Lloyd cannot only do container ships!" explains Reisopoulos. "To be able to serve the ship-owners in the tanker and bulker markets more efficiently, Germanischer Lloyd set up a special tanker and bulker team in the Piraeus office in early 2005." Highly qualified marine engineers and naval architects offer a variety of engineering services to the national and international shipping community. The array of the services offered is aimed at assisting the shipowners' technical departments in solving problems and alleviating uncertainties before, during and after contract negotiations.

These services include technical support for newbuilding projects, Condition Assessment Programme (CAP) services, Condition Assessment Surveys (CAS), evaluations of Enhanced Survey Programmes (ESP), support for and during dry docking and repairs and admission to class.

SUPPORTING THE GREEK ACADEMIC COMMUNITY

Germanischer Lloyd takes special pride in fostering maritime academic activities. It does this through training on current shipping issues, presenting technical topics and providing internships as well as sponsoring student participation in professional events. Traditionally, Germanischer Lloyd is invited by the Department of Naval Architecture and Marine Engineering of the National Technical University of Athens (NTUA) to present students and teachers with recent developments in maritime technology. In collaboration with the University of Piraeus (UNIPI) Faculty of Maritime Studies the NTUA is offering a MSc programme. Germanischer Lloyd employees are regular lecturers to the postgraduate students concerning maritime regulatory frame and the role of a Classification Society.



GERMANISCHER LLOYD IN GREECE
Since 1929, Germanischer Lloyd has been represented in Greece. In 1977 the station Piraeus was established, in 1982 GL subsidiary "Germanischer Lloyd Hellas Survey E.P.E." was founded. In 1987 Pireaus office was upgraded to an Area Mediterranean office. The "Tanker and Bulker Expert Team" was founded in 2005.

Theory & Practice: GL Academy Seminars in Greece

In the course of the past two years, the demand and need of the Greek shipping community for high standard training has found a sound provider: GL Academy.

Air pollution from ships will be reduced starting May 19th

GL Academy Informs about Marpol Annex VI

Low-sulphur fuel and catalytic converters will be used

Highly demanded topics of the seminars are attracting a number of favourable comments in Greek local maritime press.

What kicked off in 1995 with just a few seminars on only ten different topics has now become a wide-ranging spectrum of training courses for the maritime sector that convey specialist skills along with fundamental information. Strong points for the success of GL Academy are the quality of the presenters, the combination of case studies and workshops and last but not least the fat handout folder, which will accompany the participants in their daily work. ■ NL/AA

Further information: Athanasios Reisopoulos, Area Manager,
Phone: +30 6936 604600, athanasios.reisopoulos@gl-group.com

List of courses in Greece:

SEPTEMBER

27.09.2006
Maritime Regulations & Latest Amendments

28.09.2006
Shipping Basics for Banks

OCTOBER

12.10.2006
Application of Risk Assessment in TMSA

18.10.2006
Practical Aspects of Corrosion Protection for Shipping Companies & Shipyards

25.10.2006
Machinery: Damage, Repair & Maintenance

NOVEMBER

22.11.2006
High Speed Craft – Technical & Operational Aspects

DECEMBER

07.12.2006
Inspections, Surveys and Certificates

07.12.2006
Port State Control Basics

PREVIEW 2007

JANUARY

Hull & Equipment – Damage, Repair & Maintenance

FEBRUARY

Implementation and Internal Auditing of an Environmental Management System in Shipping Companies

US Coast Guard Regulations for Ship Operators

MARCH

Waste Management

Further information: Agamemnon Apostolidis, Business Development Manager, Phone: +30 210 4290373, agamemnon.apostolidis@gl-group.com

"A journey with our ferries is just like cruising"

Antonis Maniadakis on the competitive position of Minoan Lines, foreign operators that do not dare move into Greek waters and the question of national cohesion

Mr Maniadakis, Minoan Lines has a market share of 70 percent of the Piraeus – Heraklion route in the passenger sector. Seeing the strong competition, how will you keep up the pace and stay top of the market?
We always improve our services. For example we contract commercial alliances with operators from other branches like railways or hotel chains. And we offer special fares for many different groups like students or senior passengers.

What exactly are the advantages of Minoan Lines?
Our quality standard is very high. You could say we offer five star services but only take two star prices. A journey with one of our ferries is just like cruising. We are the most reliable fleet, running regularly and on schedule. And our ferries have very high safety standards. Our classification company Germanischer Lloyd is guarantees our safety. Further, for those who are concerned about the environment, we voluntarily asked Germanischer Lloyd to regularly audit our standards, according to ISO 9000 and 14000.

Could Minoan Lines be called one of the most competitive operators?
Our operational margin is one of the highest of all European companies proving our ability to compete successfully. And our services have won awards several times. It is only recently that we won the Lloyd's List Greek Shipping Awards 2005 "Passenger Line of the Year". In fact, the award was handed over by Germanischer Lloyd.

Antonis Maniadakis is Chief Executive Officer of Minoan Lines, one of the most modern and largest Greek ferry operators. Minoan Lines operates seven highspeed cruise ferries. The domestic line (Heraklion – Piraeus) is served by H/S/Fs KNOSSOS PALACE and FESTOS PALACE. For the international lines, H/S/Fs OLYMPIA PALACE and EUROPA PALACE are deployed on the Patras – Ancona route while H/S/Fs IKARUS PALACE, PASIPHAE PALACE and ARIADNE PALACE serve the Patras – Venice route. Antonis Maniadakis held different positions in the top management before advancing to head of Minoan Lines in 2005. He holds a Master's degree in International Shipping and a class A Master Mariner diploma. He is member of the Hellas Committee of Germanischer Lloyd.

Does Minoan Lines plan to extend their services within Greek waters?
No. We are with 33.3 percent major shareholder of Hellenic Seaways, the largest operator of passenger ships in that area. Therefore it is not necessary for Minoan Lines to expand activities on domestic routes.

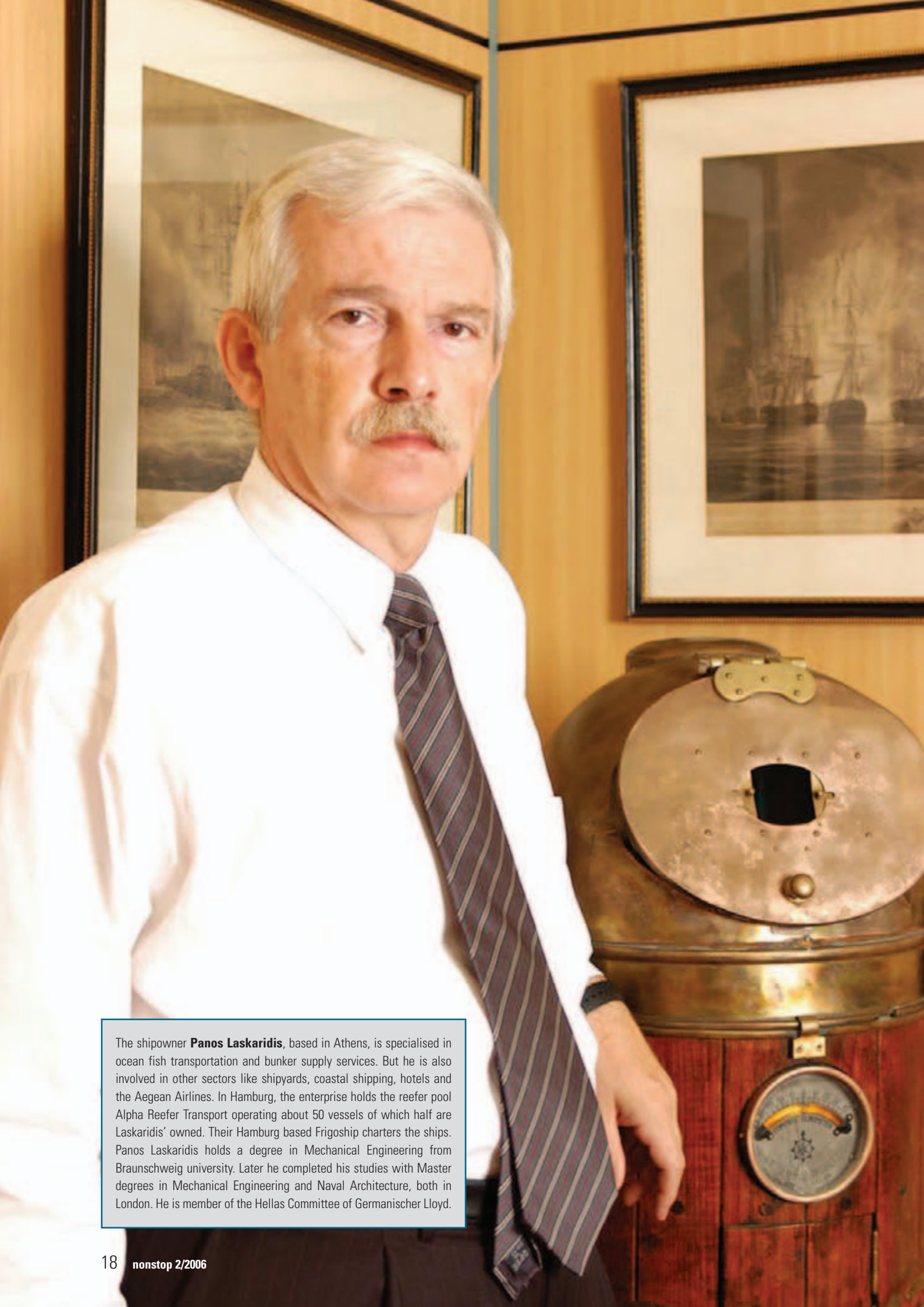
You do already have five ferries operating between Greece and Italy. Will you move further somewhere in that direction?
According to our business plan for the next five years, we are considering expanding to new routes within Europe.

Do you plan newbuildings?
No, not for the time being.

What do you believe is the reason that there are in the Greek ferry market in general not so many newbuilding orders?
The only new development that the ferry companies expect is the harmonization of the Greek domestic shipping legislation (2932/2001) with the E.U. (3577/1992). As soon as this happens the Greek companies will be able to renew their domestic fleet, ordering newbuildings.

You did move out of Greece. Why have no non-Greek operators moved into th Greek ferry market until now?
Well, we are free to go and do so. They are free to come, but they do not. That shows that Greeks are very good in the shipping business and very competitive. Furthermore we have, on time, modernised our fleet and made it even more competitive.

How do you see the discussion about the age limit of vessels and the Stockholm convention?
That is not an issue directly related to Minoan Lines. Our vessels are very young, the oldest one was only delivered in 1997, the last ones in 2002 which fully comply with the Stockholm agreement. But the issue concerns our affiliate Hellenic Seaways. Overall the main challenge for the market is to replace the old fleet. Some of the Greek companies – mainly the major players – built new faster and bigger vessels aiming to improve their services towards their customers. Coastal shipping and the social service provided is of paramount importance for the Greek economy given the complexity of the vast island network in Greece. Apart from the services in the "busy" summer season ferries provide the vital connection to the mainland for the local island economies throughout the year, contributing to the national cohesion and upgrading the national tourist product. ■ NL



The shipowner **Panos Laskaridis**, based in Athens, is specialised in ocean fish transportation and bunker supply services. But he is also involved in other sectors like shipyards, coastal shipping, hotels and the Aegean Airlines. In Hamburg, the enterprise holds the reefer pool Alpha Reefer Transport operating about 50 vessels of which half are Laskaridis' owned. Their Hamburg based Frigoship charters the ships. Panos Laskaridis holds a degree in Mechanical Engineering from Braunschweig university. Later he completed his studies with Master degrees in Mechanical Engineering and Naval Architecture, both in London. He is member of the Hellas Committee of Germanischer Lloyd.

"We are blue water people"

Panos Laskaridis forecasts the future of reefer vessels, explains his next plans and tells how he nearly ended up being surveyor for Germanischer Lloyd himself.

Mr. Laskaridis, today the capacity for reefer boxes on large container vessels exceeds the conventional reefer vessel capacity. Is that the end of the reefer ship business?
The reefer business has a limited future. Containerships are taking much of our business. At the moment the proportional dispersion of cargo between container vessels and reefer ships is fifty-fifty. But in maybe ten to fifteen years some 75 percent of the tonnage might be transported with containerships, only 25 percent with the conventional reefers.

How do you expect the sector to keep at least this 25 percent?
Not all types of products are suitable for containers. And fortunately especially our cargo is not dependent on containers. The reefer business has to protect its niche markets to keep its business.

Are you trying to expand the reefer business or will you slowly shut it down?
Only recently we sold a big number of vessels, close to 50 ships. But that does not mean that our fleet decreased by 50 ships. We chartered vessels back again. Altogether our fleet numbers to some 70 vessels.

Will you go into the container vessel business?
No!! Container vessels are a totally different market. It is not just a matter of replacing reefer vessels by container vessels with reefer boxes. But we are considering expanding into the tanker and the bulker business. We already have nine small tankers but we do not use them in the open market. We use them only to sell fuel on the high sea which is a very interesting service going together with the conventional reefer business.

When do you plan to make the step into that tanker segment?
As soon as the market conditions are suitable which does more or less mean the market prices must be quite low. Maybe that will be in a few years, I have the feeling that that time will soon come.

What is it that makes the Greek shipowners so much attached to this segment?
The Greek trade assets. They ove to sell whenever the purchase prices are high. With tramp business they keep the freedom to sell assets as they like. Unfortunately in the reefer business it is not possible like that. It runs more on the long term, with firm contracts.

You do also have shares in the ferry business. Could you imagine replacing the endangered reefer business with coastal shipping?
No, we are no coastal people, we are blue water people and we want to stay that. Coastal shipping is a side investment.

What do you think of the discussed age limit for Greek ferries? Nowhere else in Europe is there an age limit for passenger ships.
With a general age limit many vessels will from next year on pass that limit. That is a very big problem, especially for the island connections. But I think after all Greece should have such an age limit. In other countries like the UK the passenger ships have in their lifetime been through very strict inspections. I hope that also in Greece the maintenance standard will improve and the inspections will be more thorough.

Your recent business is not just the shipping business. Are you trying to get away a bit from the shipping world and move towards the shore?
We do have to invest somewhere. But shipping stays our business. It is very interesting, more interesting than anything you would find onshore.

You are one of the oldest customers of Germanischer Lloyd in Greece. In coastal shipping the cooperation is very strong. Furthermore you have twelve reefer vessels presently classed with Germanischer Lloyd and since the mid-90s you have had 18 vessels built in the Ukraine with Germanischer Lloyd class. Why?
I have had extremely good experiences with Germanischer Lloyd and am satisfied. And so did my father. Even the first vessel my father Konstantinos Laskaridis bought in 1961 had Germanischer Lloyd class. It was the Kyknos-I, the ex-name was Sachsen. I even nearly ended up working with Germanischer Lloyd. When I came back from my studies my father wanted me to work as a surveyor for Germanischer Lloyd in Greece at the office of Mr Sefertzis who established the first station in Piraeus as a non exclusive office. Well, anyhow, I then went into my fathers business. ■ NL

PHOTO: PANOS LASKARIDIS

"Probably the most diversified company in Greece"

Anthony Comninos talks about diversification and his most preferred vessels – containers and bulkers. And he speaks up against common rules for bulkers.

Mr. Comninos, when one looks at your fleet the diversification is striking. Is it useful to play in so many different segments?
It is very difficult. But on the other hand that is how we survive. Back in the 70s we were probably the most diversified company in Greece and it proved to be correct. There were for example times the bulker market was dead. The remaining sections of the fleet such as tankers, multipurpose or reefers earned enough to compensate the lack of revenue from the bulker segment.

The reefer business used to be one of the central segments of Target Marine. What is your position today with the reefer vessels being steadily replaced by container vessels with reefer boxes?
From the beginning of my shipping career we had a mixed fleet of bulkers, tankers and tweendeckers until the mid-1970s when we ventured into the reefer market which steadily grew in size. From the mid-1990s we began to steadily reduce involvement in reefers to reach the present 4-ship reefer fleet. The four reefers we have today we keep for sentimental reasons. When they go we will close down the department. It is only a matter of a couple of years. We will not continue with the reefers as we do not believe there is a future. Reefer Containers are mostly cheaper. With the bunker prices today reefers make no more sense. They will only survive for specific trade. Today there are about 700 reefers of over 100,000 cubic feet. In the future, there will not be more than 300 ships.

If you had to choose between different segments, which vessels would you take?
Containers, bulkers and tankers.

As regards the bulkers, what do you think of the common rules that are rather controversial?
For bulk carriers a lot is left to be desired. A good step forward is the GRAB notation for all BC-A vessels. However, more needs to be done in terms of corrosion margin and loading flexibility. What is necessary is a good initial thickness of the vessel's structural members. Then, you can sandblast and recoat them. 75 percent of the cargo of bulkers is very aggressive, like iron ore and coal. It attacks the surface. And when the coating has gone, only the metal is left. It is less resistant and pitting corrosion can proceed rapidly.

With such aggressive cargo, why then should a double hull not be useful?
Double skins might even be a disaster. Repair and maintenance becomes a big problem due to inaccessibility. A single hull bulker

Anthony Comninos is Head of Target Marine, a private shipping company based in Piraeus. The shipowner provides commercial and technical ship management services. Anthony Comninos started his shipping career in 1964 just after he finished high school. He "learned the business more or less within the family business" as he points out. His father started off with coastal shipping in 1938. In the early 60s his brother went into ocean shipping with liner ships for general cargo. Today the company owns four reefer vessels, six container ships of up to 1800 teu, two bulkers, two panamax product carriers. Four panamax tankers class 1A with fully electronically driven engines are soon to come.

might therefore be better for a longer period than a double hull bulker. The issue here really is the coating. Therefore we would very much like the classification societies to have a say and regulate matters. They could guarantee the quality of the coating standards and therefore minimize the risk of corrosion. However, D.H. designs might be attractive for cape size tonnage once the designs are developed to meet the operating criteria.

You already moved into the container segment in the 90s. At that time you purchased second-hand vessels. Why no newbuildings ?
We did not know the container market at the time and this lack of experience was instrumental in directing us to lower-risk investments in good second hand ships. Now that is different. We feel comfortable, we understand the industry, we have the knowledge and we know people in the industry.

But still you do not have container newbuilding orders in the books.
We missed the last reasonable time to buy them, now prices are too high. But eventually we will go into newbuildings. I want to create a small fleet of containers. The vessels shall be up to 5000 teu. But I can also imagine buying good young secound-hand vessels.

What are your overall goals for the upcoming years?
I want to increase the tonnage and have a mixed fleet of 20 to 25 vessels. Furthermore we want to modernise the fleet and replace older vessels.

Do you plan to go into the stock markets like so many other Greek shipowners?
Going "public" is not one of my priorities since I have always operated in the framework of a private enterprise. The younger generation have ample opportunity to pursue growth through the public markets.

You are not working with Germanischer Lloyd at the moment. With your goals in the container segment, is there a chance for Germanischer Lloyd to cooperate closely?
We have cooperated with Germanischer Lloyd in the past and I do not see any reason for not doing it again especially with containers where GL is the most experienced classification society for this type of vessel. As I am in the GL Hellas Committee I can see a great deal from the inside and I am quite prepared to positively consider GL in the coming years. ■ NL


SUDU
MAX PAYLOAD
SUDU

20x8x8.5 Feet

It may well be that the container concept was simply "in the air" at the time. But perhaps you need a special sixth sense to recognize things that are really quite elementary. Whatever it was – the basic idea of using a big metal box over the entire transport path of a commodity was certainly slow in coming. The man who had this brainwave and persevered in putting it into practice needed almost 20 years.

The success story begins in 1937, when the young trucking operator Malcolm McLean from New Jersey was delivering a load of cotton bales in the harbour of Hoboken. As had so often been the case, he again had to wait for hours: "I sat there and watched all these people, how they used their muscle power to heave every single crate from the truck, and how they hung them on the slings that carried the consignments onto the ship. There, other stevedores took every single piece out of the sling and carried it to a place in the hold where it could be stowed securely," McLean recalled many years later. "And I thought, now wouldn't it be grand to lift the entire trailer onto the ship, without even having to touch the contents?" In principle, the container had already been born.

Photo: bremenports

Malcolm McLean (*1913 - †2001)

Founding a Trucking Company in the Great Depression

The man with an eye for common sense and practical action was born in 1913 into a humble environment in Maxton, North Carolina. In 1934, right in the depths of the Great Depression, he founded the McLean Trucking Company in Red Springs. Twenty years later, he had built it up to the second-largest trucking firm in the United States. Through all this time, McLean had not forgotten his idea of how ships could be loaded more rapidly. But it was only now that the entrepreneur took steps to make his vision a reality. In the year 1954, he sold the trucking company and purchased the Pan-Atlantic Steamship Company. The haulier had become a shipowner.

Buying this particular firm was no coincidence; the shipping company possessed a small fleet of T-2 tankers, the decks of which had been fitted with lashing points for the carriage of oversized cargo, such as aircraft, during the war. These vessels were easy to convert so that specially designed trailers could be secured in them. On 26 April 1956, the big day arrived: Malcolm McLean had 58 trailers with a length of 35 feet loaded onto the deck of the "Ideal X", the first of the refitted T-2 tankers, in the Port of Newark, New Jersey, and sent the vessel off to Houston, Texas. And then the new shipowner tallied up the costs: sending the trailers as seafreight was several times cheaper than on the road through several states.

And then things really started moving. McLean refitted more T-2 tankers and got them under way with trailers aboard. In 1957, he purchased the Waterman Steamship ocean shipping company and had its ships refitted to carry trailers below deck. These freighters were equipped with two deck cranes running on rails, to heave the 35 foot vans from the pier into the cargo holds. Later, he founded the shipping company SeaLand, which dominated the East Coast of the United States and initiated container service with the West Coast through the Panama Canal.

The Container Comes to Europe

The era of the container in Europe began on 2 May 1966, when the "Fairland" tied up in Rotterdam – a momentous event that was followed by the European shipowners with mixed feelings. On 5 May 1966, this pioneering vessel called at the Port of Bremen. The wave of scepticism ran high, with witty comments making the rounds. And yet, by the end of the 1960s, leading German shipping companies had become converts to the container.

Nowadays, it is often overlooked how long the container actually took to attain the ISO standardization common today. At no time did McLean forget what he had really accomplished: "I loaded hundreds of trucks onto one ship." In the end, only the cargo containers themselves were loaded onto the ships, and no longer entire trucks and trailers. However, the Europeans were not able to handle the dimensions of these containers. It took a lot of work until the sizes defined by International Organization for Standardization (ISO) for the container were eventually finalized in 1964 – a compromise that was far from ideal. Owing to the ISO standard measurements of 20 x 8 x 8.5 feet (6.06 x 2.44 x 2.59 metres), it is not possible to accommodate two euro-pallets crosswise, with their length of 1.20 metres. Twenty percent of the possible storage space is therefore lost.

Despite these flaws, the box prevailed to become the standard unit in the transport business, as the 20 foot container. So much so, in fact, that the term "twenty foot equivalent unit" – or TEU for short – is now also used to denote the stowage capacity of container ships. The largest container carriers afloat today, the COSCO Guangzhou and its sister ship, the COSCO Ningbo, can take on almost 9500 TEU. The standard 20-foot box was joined by other dimensions and types. Nowadays, the most common version is the 40 foot container (2 TEU or 1 FEU), with special

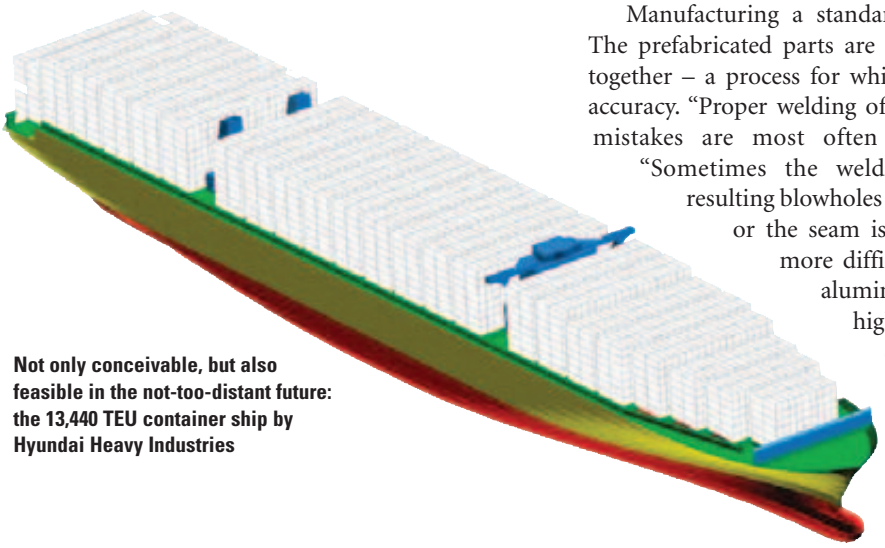
Christening of the COSCO Ningbo: Wolf-Dieter Enter, Station Manager Ningbo, Werner Enning, Area Manager China Germanischer Lloyd, Juzhen Hou, Business Development Manager China Germanischer Lloyd, Hergen Thielemann, Division Manager East Asia Germanischer Lloyd, Thomas Murken, Country Manager China (from left to right)

sizes of 30, 45, 48 and 50 feet in length, and special widths and heights. Also much in use are the tank containers and refrigerated containers (reefers), which require an electrical power socket. For certain goods, there are containers that are open to the top or side, and for heavy cargo there are the "flat racks". What really counts is that they can all be stacked.

Annual Production: 2 Million, Manufacturing Country: China

About two million containers are manufactured worldwide every year, with the lion's share coming from China. Some 400,000 to 600,000 containers are certified annually by Germanischer Lloyd. "The tasks of the inspectors lie in acceptance testing the individual production runs, i.e. checking whether the GL regulations have been observed," explains Guido Hageböck, responsible at Hamburg Head Office for the approval and certification of containers. The certificates for a production series are issued only in Hamburg.

Manufacturing a standard container is quite a simple process. The prefabricated parts are put into jigs, clamped and then welded together – a process for which it is essential to achieve dimensional accuracy. "Proper welding of the container is the name of the game; mistakes are most often made here," says Guido Hageböck. "Sometimes the welding workmanship is poor, with the resulting blowholes and pores, or the wrong filler wire is used, or the seam is too weak." Reefer containers are much more difficult to make, because stainless steel and aluminium are used. But the demands are also high for the flat racks used for heavy machinery: "Here good welding of the 12 to 15 millimetre thick steel plates is particularly important." At present, about 1600 to 1800 US dollars must be paid for a 20 foot container, while a reefer container will set a shipowner back by some 20,000 dollars.



Not only conceivable, but also feasible in the not-too-distant future: the 13,440 TEU container ship by Hyundai Heavy Industries

With 9,449 TEU, the COSCO Guangzhou is arguably the largest container ship afloat today

Bell Vanguard – a model of the first German container ship in 1966

Containers are stacked up to eight tiers high on deck

An empty standard container weighs 2.3 tonnes, and a 40 footer about 3.8 tonnes. The load of the empty boxes carried on a container ship is therefore considerable. A study by Germanischer Lloyd for an ultra-large container ship of 13,440 TEU allows for a weight of more than 30,000 tonnes (calculated on the basis of standard containers). Transporting empty containers halfway around the world – a consequence of the asymmetrical flow of commodities – represents an appreciable cost factor for the shipping companies.

Building Block of Globalization

Over a period of decades, Malcolm McLean promoted the triumphant advance of the container, without ever forgetting the real reason for his success. For it lies not in the world-spanning logistics chains, nor in e-commerce and the logistician's craft, which has indeed come to full blossom with the Internet. "It all boils down to the freight price," McLean pointed out time and time again. For instance, getting a bottle of wine from Australia to Rotterdam costs 25 cents when transported in a container. A wine lover who drives three kilometres to his local shop pays much more, just for that single car trip. Thanks to these low freight costs, any trader can offer goods at low prices almost anywhere in the whole world. This is the reason that the container, in league with the Internet, is the most important building block of globalization.

When Malcolm McLean died in 2001 at the age of 87 in New York, people around the world paid tribute to his accomplishments. But the man who invented the metal shipping box had his share of failures too. He ordered the fastest cargo ships that ever sailed – the SL-7 type container ships, with a speed of 33 knots (over 66 km/h) – but, during the oil crisis of the 1970s, they all had to be sold as too expensive to run. At the beginning of the eighties, he created, through the United States Lines shipping company, a far-ranging line and feeder service all around the world and, through the "Econships", the largest container carriers in the world (4456 TEU) – and yet was forced to sell the company in the end. His greatest gift was perhaps the knack of gathering talented young people around him, including the marine engineer Charles Cushing. The employees from earlier days still admire McLean and his achievements up to the present day. In honour of the man who invented the container, the McLean Container Center is being opened at Kings Point in Florida, as a museum with an archive dedicated to Malcolm McLean and an idea that changed the world.

The triumphant advance of the container has by no means ended. Container ships will grow even larger, with the containerization of goods and commodities increasing steadily. Freight specialists the world over will continue to work tirelessly until everything in the world can fit into the box. Even today, you have to look fairly hard to find something that will not fit into a container. How about giraffes? Yes, but don't bet on it yet. ■ HS

FOTO: HASENPUSCH

Cold ironing gathers m

Container ships calling at US ports are going to face increasing pressure to source shore-based power when alongside berth. Possible solutions should already be considered at the design stage.

"Turn off the auxiliary engines and plug in!" is the message for container vessels calling at the Ports of Los Angeles/Long Beach, some of the world's busiest terminals. It is estimated that ships calling at LA produce 31.4 tonnes of nitrous oxide per day which contrasts with only 0.5 tonnes produced daily by 500,000 cars. Local air regulators say that as much as one quarter of the pollution in Los Angeles emanates from the ports of LA/LB.

Hence maritime interests have been under severe pressure to cut emissions for some time already. "Cold ironing", whereby ocean going vessels are supplied with power from the electrical grid ashore to turn engines and auxiliaries off when in port, was launched in Los Angeles in June 2004, when China Shipping's vessels Xin Yang Zhou and Xin Nan Tong plugged in. This first initiative relied on a dedicated port barge – floating close to the ship at berth – for all the necessary equipment for the shore connection. This included the high voltage and low voltage cable management system, transformer and switchgear. It has been a fairly costly configuration, born out of necessity since only a few ships so far have been specifically designed for alternative power solutions. Also it would not have been possible to install all the necessary equipment on shore due to space constraints.

A second more sophisticated shoreside power programme was launched last year with Japanese carrier NYK. The company commissioned the first vessel with an integrated onboard electrical system to allow for cold ironing, the NYK Atlas. It was allegedly the first vessel able to plug directly into the wharf without the use of a barge. The emission savings from the ship are said to amount to 31 tonnes of nitrous oxides and 1.4 tonnes of particulate matter. Pioneers of the technology have been offered substantial incentives with the Los Angeles Board of Harbor Commissioners approving an $810,000 'cold ironing' reimbursement to NYK last year. However, such rewards are not likely to be continued very much longer it appears, as both LA and LB are speeding up the electrification of the piers. Once all the "sockets" are installed, there is every likelihood that shipping companies will face financial penalties for still using diesel engines in port. It will also become an issue for ships calling elsewhere in North America. A number of other ports, including Houston, Richmond (Virginia), New York/New Jersey, Seattle, Oakland, Tacoma, Vancouver and Philadelphia, have indicated that they are planning to adopt alternative power solutions, too. Elsewhere initiatives for shoreside power are cropping up in the Baltic Sea, initially focussing on the German port of Lübeck (New Hansa Project), while Nagoya (sister city to LA) is understood to be taking a close clook at cold ironing. There is no international technical standard for the ship-to-shore connection points, yet, but the IMO has called upon the International Standards Organization to develop a formula. This process is expected to take two to three years from now.

Going forward the best practical solution seems to be the fully ship integrated system. The cable management system, shore connection panel, transformer and shore incoming panel are built into the design. Apart from the NYK Atlas a number of other vessels have been delivered to that standard, including the MSC Rania and Evergreen Hatsu Marine. Other concepts being marketed by marine suppliers include semi-fixed containers and the all-in-one removable container. The semi-fixed container offered by Cavotec NV contains the shore connection panel and transformer, while the cable management system can be either placed directly on the vessel or inside the container. The idea is to load the "power box" on the ship for the time it is entered in the US West Coast trade. The downside to that is that shipping companies have to spare 2 teu slots which cannot generate freight income any more. They can circumvent this problem with the all-in-one removable container, which contains all the necessary equipment and which is supposed to be loaded on board the vessel straight after mooring. However, carriers will have to pay handling fees and demurrage as the box is to be stored in port for the remaining time of the round trip.

According to Cavotec NV, carriers and shipowners embracing the cold ironing technology include: NYK, China Shipping, Peter Doehle, NSB-Conti, Evergreen, MSC, CP Offen, Patjens, Yang Ming, B&N Transocean, Hansa Shipping and Italia Marittima (formerly Lloyd Triestino). Container ships equipped for shore-side power supply range from 1,570 TEU to superpostpanamax vessels of more than 8,500 TEU. But their share of the overall fleet is still insignificant. It is estimated that only 6% of all container ship newbuildings to be delivered between 2005 and 2008 are designed for cold ironing, while for ships with more than 5,000 TEU capacity the figure stands a bit higher (11% or circa 40 units). ■ MPH

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omentum

KEEP YOUR OPTIONS OPEN

Shore-side power solutions for ships are today a stand-alone solution for the Ports of LA/LB since there are no firm international standards for the ship-shore interface so far. Owners investing in cold ironing capability are therefore taking a gamble with respect to its compatibility in other ports once the system spreads throughout the world. Those wishing to wait for a standard system to shape out in the next few years, are advised to allow for a smooth implementation of the technology on their new-buildings in the future. Quotations from yards for retrofitting existing ships have been in the order of Euro 900,000. The investment can be kept to a minimum through installation of an upgradable power control panel and preparation of a special foundation for the "power container" to be installed later. This box will contain most of the necessary extra equipment such as switchgear, cable reel etc.

The venue for the committee meeting met with the approval of all the participants. Hergen Thielemann, Division Manager East Asia for Germanischer Lloyd, certainly had the right idea when he invited his best customers and business partners to Sanya on the Chinese island of Hainan at the end of March.

The Good Spirit of

Sanya

The joint meeting of the ASEAN Committee and the China Committee led to a lively inter-Asian exchange of views on current issues of shipping policy and questions of ship technology. The discussions centred on the perspective analysis of the challenges to the world economy, the global trends and their effects on business, the role of China as a driver of growth in world commerce, the opportunities for India on the way to modernization, as well as the development of maritime clusters with due consideration of the worldwide trade flows.

What role the mega container ships with a size exceeding 13,000 TEU can play was examined in detail by Jan-Olaf Probst, GL Ship Type Manager for Container Ships, which fitted together well with the general evaluation of current developments in container shipping given by Ms Jin-Hyun Bae from Clarkson Research Services.

With a focus on the relocation of Jiangnan Shipyard from the city centre of Shanghai to Changxing Island, all participants were given a good overview of how consistently China's ambition to become the number one in shipbuilding is being realized. Hu Keyi left no doubt that the deadline would be met.

Matters of technical interest were also given their fair share of attention at this session. Initial experience following the introduction of MARPOL Annex IV last year provided the opportunity of tackling the causes of engine failures through contaminated fuel oil from a scientific standpoint, of discussing the alternatives to conventional engines, and of classifying the various fuel grades in relation to their operational effects.

Professor Dr Horst Rulfs from the Technical University of Hamburg-Harburg regarded the main problems as being microbacterial infection, catalytic traces ("fines") arising when the fuel is refined, corrosion effects at high combustion temperatures and the international adulteration of fuel with water, acids, chemical wastes or used oil. For example, polypropylenes in the fuel tanks lead to serious clogging of filters, and thus to drops in performance or even engine stoppages. As a result of the revised ISO 8217 specifications, fuel-related engine problems will – correct application assumed – be reduced further.

How fuel quality is determined in practice was explained by Joe Ng, CEO of Global Energy and Stenmar Shipmanagement, one of the top players amongst the bunker service providers in the Port of Singapore. Joe Ng outlined most vividly the significant role played by reliable suppliers and good fuel quality in ensuring trouble-free ship operations. He warned against purchasing fuel at dumping prices, which at first glance might seem attractive but was bought dearly with inadequate quality and poor after-sales service.

Shortly before the introduction of the Common Structural Rules for tankers and bulk carriers on 1 April 2006, a knowlegeable presentation on the relevance of the new rules for the safe operation of these ship types was indeed most appropriate: Dr John Kokarakis, Head of the GL Tanker & Bulker Team in Piraeus, explained the philosophy of the working groups which over the past years had concerned themselves with the two ship types and had formulated the new construction rules for safer, more robust and more economical ships. In particular, he underlined the innovative elements of the new rules by highlighting certain aspects: the net scantling approach, the ultimate strength check of the hull girder required in future, an assessment of the buckling strength for both ship types that is as uniform as possible, harmonized and direct strength assessments of the cargo hold structure and a minimum design fatigue life of the structure of 25 years.

His second paper showed the participants what design requirements needed to be fulfilled by modern tanker concepts. The experts discussed alternative construction variants for the various parts of the hull structure, inter alia with consideration of the buckling strength behaviour and the requirements of the Finnish-Swedish Ice Class requirements with a view to the future use of the Northeast Passage. Emphasis was also placed on the new IMO regulations for the protection of fuel tanks. Particular interest was generated by Dr Kokarakis with his description of the computation services of the Hydrodynamics Department (ESH) at Germanischer Lloyd for the dynamic loading of the tank structure as a result of ship movements (sloshing).

A comprehensive overview of the engineering services provided by Germanischer Lloyd was given by Ulrich Behrens, Head of Engineering Services in China. GL offers analyses and solutions in the classic fields of hydrodynamics, strength assessment and fatigue analysis as well as vibration and acoustics, and also undertakes experimental examinations in certain situations to examine problems in depth. With advice and a range of associated services, the experts provide valuable support in all phases of the design, during construction and at the sea trials. Even after the final inspection, problems may occur which exert a considerable influence on the economical operation of the ship. In such cases, the GL specialists assist as trouble shooters to measure vibration, identify sources of noise and suggest possible solutions. Thanks to long-term data acquisition, ship motion analyses can be carried out to further optimize everyday ship operations. ■ OM

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SINGAPORE SETS THE QUALITY STANDARDS

In 1993, the Maritime and Port Authority of Singapore (MPA) submitted its first standard on bunker quality, with revised versions following in 1996 and 2004. As a supplement, the Code of Practice for Bunkering (CP 60), the Code of Practice for Bunker Surveying (CP 77) and the Quality Management System for Bunker Supply Chain (QMBS) were issued to improve Singapore's international reputation as a bunker port. In 2005 alone, more than 25.5 million tonnes of bunker oil were handled there. In view of the significance of this branch of industry for the port and its customers, the demands placed on the bunker supply companies have increased constantly. All fuel providers must comply with the national CP 60 standard, which contains detailed procedural instructions and also describes the equipment-related requirements for the tankers, to prevent disputes between the shipping companies and suppliers with regard to the fuel quality. What is more, since 3 June 2005, the MPA has required an accreditation of all bunker suppliers, a minimum paid-up capital of 200,000 Singapore dollars and, apart from a certified QMBS, the attainment of key performance indicators. At present, more than 70 supply companies have been accredited. The transportation of bunker oil in tanker vessels is tightly controlled. Supply firms must deposit authentic copies of the tank calibration tables with the MPA. Before every bunkering operation, the other tanks on board the

tanker must be inspected for content and quantity. Comprehensive documentation on board the tankers is mandatory. The fuel quality is safeguarded by the regulations as per CP 60, which corresponds to the ISO standard for marine fuel (ISO 8217). These quality standards must be satisfied by the accredited companies. Furthermore, CP 60 takes into account Annex VI of the MARPOL Convention whit respect to the sulphur content in the fuel oil. With the founding of a Bunker Quality Advisory Panel on 5 September 2005, all fuel samples are registered systematically, in order to take substandard fuel out of circulation before it is bunkered.

Complementary Rules published

On 1st April 2006, the new Common Structural Rules (CSR) for tankers and bulk carriers came into force. The sets of rules are applicable to double hull oil tankers of a length equal to or greater than 150m and bulk carriers of 90m in length or above. Due to the limitation of the new rules, Germanischer Lloyd has issued a set of complementary rules for its clients containing structural design elements which are missing in the IACS documents.

For tankers, the print edition of the IACS Common Structural Rules is divided into four volumes. A fifth volume contains a new set of complementary rules by Germanischer Lloyd for Double Hull Oil Tankers which are not covered in the CSR part. The table of contents contains the following sections:

Section 13 – Rudder and Manoeuvring Arrangement

Section 14 – Tankers in Shuttle Service

Section 15 – Strengthening for Navigation in Ice

For bulk carriers the print edition of the new IACS rules is divided into three volumes plus a volume on complementary rules by Germanischer Lloyd. Both single-side-skin and double-side-skin bulk carriers are covered by CSR. The table of contents contains the following chapters:

Chapter 14 – Strengthening for Navigation in Ice

The new rules are aimed to fulfilling the main objective of the common endeavour: safe, robust and fit-for-purpose ships. Due to stricter fatigue criteria, increased scantlings and greater steel-weight, well maintained ships built to the new rules are expected to experience less structural problems, require less repairs and steel replacement during their service life. The minimum fatigue design life has been upgraded from the 20 year worldwide trading to the more rigorous 25 year North Atlantic environment.

For ballast water tanks, coating requirements within the CSR explicitly adopt the future IMO Performance Standard for Protective Coatings from the time that the standard is agreed within IMO and their subsequent entry into force as a part of SOLAS.

Germanischer Lloyd has already published new rules on crude oil tanks for improved corrosion protection. The class notation 'CARGO TANK COATING' regulates all aspects of coating, indicating where and how coating is to be carried out, but also covering other important items such as surface preparation and the relevant survey processes. The evaluation of coating condition will be implemented into the survey programmme so that on demand the class notation can be maintained. Consultancy will be offered in case maintenance and repairs are necessary and relevant steps will be carried out under the supervision of a GL surveyor who guarantees observance of the proper procedures as well as high-quality workmanship.

With the adoption of the new rules, Germanischer Lloyd has embarked on a comprehensive strategy of introducing an "all included package" for all the shipyards, clients and design offices. ■ OM

All rules are available online on the website of Germanischer Lloyd:
www.gl-group.com/infoServices/rules/pdfs/english/glrp-e.pdf

The print edition can be ordered at:
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Underway the Right Way

Tanker accidents in Europe's territorial waters have triggered far-reaching changes to shipping legislation: single-hull tankers must be decommissioned by 2010; single-hull tankers running on heavy fuel oil may no longer call at European ports; ship controls will be tightened up; access to ports will be denied to certain types of high-risk ships; the European Maritime Safety Agency (EMSA) was established.

The Third Maritime Safety Package now aims to establish a "European maritime space for safety in shipping". With the enlargement of the European Union to 25 member states, some 25% of the global tonnage is now sailing the flags of EU member states. As much as 40% of the world's merchant fleet is economically controlled by European shipping companies. By this token, the EU has become a major maritime power, for whose good conduct the EU Commission feels responsible: from its standpoint, steps must be taken to ensure a uniformly high standard of safety for all European flags. The Commission also sees a need for action as a result of the risks associated with the growing volume of ship traffic in European waters. Every year, a billion tonnes of crude oil – amongst other potential pollutants – are handled in the ports of the EU or transported through European territorial waters.

More Responsibility for the Flag States

The quality of the national flags of its member states and the safety of maritime traffic in European waters are to be improved and secured by seven guideline proposals of the Third Maritime Safety Package. These address the responsibility of the flag states, the procedures of Port State Control, the monitoring of vessel traffic, the harmonized investigation of accidents at sea, compensation for damage suffered by accident victims, and the liability of shipowners under civil law.

One of the proposals is concerned with the amendment to EU Directive 94/57/EC on classification societies. The new version of the Directive intends to improve the quality of the work carried on by these classification societies, as organizations authorized by the member states to perform ship surveys and certification tasks. In particular, the EU Commission wishes to ensure that the flag-state recognition of classification societies will no longer depend on size (i.e. number of ships in class), but solely on quality and performance in terms of safety and environmental protection. Moreover, through the establishment of a "joint body" for quality system assessment and certification, the aim is to bring the classes under its supervision. In the event of infringements, financial penalties will be imposed.

Double-hull tankers are to be mandatory from 2010, to increase the level of safety in shipping

With a view to the civil liability of shipowners, the EU Commission wishes to improve the prevention of accidents and pollution through increased responsibility on the part of the owners. The existing system of limited shipowner liability in cases of serious pollution caused through gross negligence is to be terminated, in that the 1996 Convention on Limitation of Liability for Maritime Claims (LLMC) will first have to be implemented in European law, so as to obtain a mandate for revising this convention. Here the long-term objective is to revoke the limited liability of shipowners and to supplement the liability with an obligatory financial guarantee system.

EU with Ambitious Intention

With the Third Maritime Safety Package, the Commission has set itself an ambitious goal. Implementing the international ship safety regulations in European law would transfer the present competencies of the member states in this area to the EU. The Commission would then become the central figure in matters of ship safety, even in international forums.

Whether the member states are actually willing to hand over their powers to Brussels in this way is open to question. With the enlargement of the Union by the shipping states of Malta and Cyprus, however, and in the wake of the serious tanker incidents that have occurred, there may be certain readiness in political spheres to a new division of tasks between Union and member states. Nevertheless, the Commission has further medium-term targets in mind, as the justification of the package indicates: one European flag, a single European coast guard, and unified European representation in the IMO.

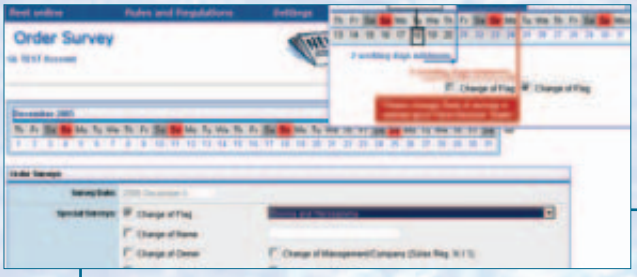
Lengthy negotiations must be expected in view of these controversial questions and the complicated technical details, especially as the Commission would like to see the package ratified as a whole. ■ CH

PHOTO: EMSA

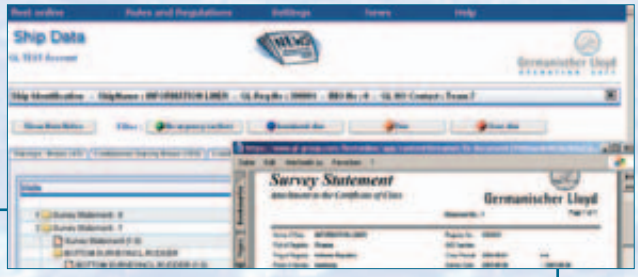
Lisbon: with the Third Maritime Safety Package, the EU Commission has set itself the goal of having the competencies of the member states transferred to EMSA.

24/7, practical and efficient

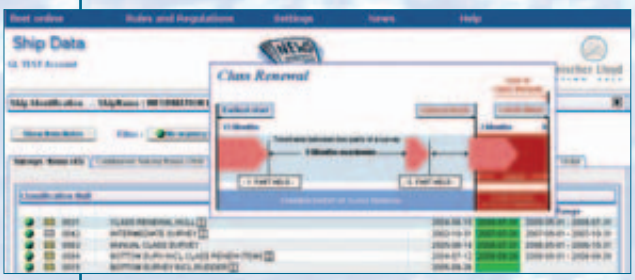
How can shipowners and employees of shipping companies be assisted with their daily work? Germanischer Lloyd provided the answer to this question by introducing its free Internet-based fleet management tool “fleet online” back in 1999. Ever since, customers have been able to plan, order and monitor classificatory and statuary surveys online. Today, some 729 shipping companies manage in excess of 3,000 ships via 1,500 customer accounts. To date, this has led to a good 22,000 ship surveys being ordered online. This makes “fleet online” the most successful tool that Germanischer Lloyd has offered its customers for optimising their fleet management.



Survey order form: After specifying a survey date, all relevant dates due to this point are shown. Thus, different surveys can be consolidated wisely.



All survey statements can now be accessed online at all times.



The scheduler: Graphic elements are used to enhance the clarity of the survey dates planned

New functions –
FLEET ONLINE ON COURSE FOR THE FUTURE

Shipowners and shipping companies can now access the current positions of their ships online, allowing them to monitor their arrivals and departures more precisely and plan their deployment more exactly. This function also enables surveyors to plan their own schedules better. The ship's positions along with the IMO No., speed, course and port of destination are generated at the same time by the Automatic Identification System (AIS), which picks up this data in coastal areas. At present, this service is available for virtually the whole of Europe, Asia and North America and is being constantly expanded. In this way, shipowners retain control over their fleets, irrespective of where, how often and when they want to call up this information.

The advantages of "fleet online" are plain to see. In just a few, simple steps, this tool allows surveys to be planned, ordered, monitored and coordinated to best fit in with ship deployment schedules. It is possible to access the current status of the ships and the obligatory dates for reclassing and surveys. A special feature in this regard is that "fleet online" also allows ships that do not have a GL class to be integrated and managed. In addition to a more clearly structured user interface, the range of services offered by "fleet online" has now been extended with a number of new functions.

By way of example, the "Automatic-Mail" function has been enhanced. Four weeks before a prescribed survey is overdue, a message is automatically sent by e-mail giving notification of this date so that the shipowner can respond in good time. It is also possible to customize this function. For example, one can change the interval and set that notifications should be sent when surveys are overdue and in case of prospective changes to the class status.

Since the introduction of "Technical Reporting and Ordering Networks" (TRON), the reporting tool of the globally active GL body of surveyors, it has been possible for the surveyors to document the information recorded during and after a survey on their laptops and to transfer this information via a secure Internet connection to the ship's database. TRON sets new standards with regard to speed, user-friendliness and quality. The data transferred in "fleet online" is continuously updated a number of times each day. As such, shipowners and managers can access and view the latest "Statements of Survey Dates" online within 24 hours of a survey being conducted and transfer these into their own IT systems. This integration facility greatly simplifies the task of fleet management. ■ SG

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Complex technology: modern membrane carriers employ a complicated sandwich construction for their tanks

Going Farther than a Pipeline

World demand for natural gas is rising dramatically. But not every high-demand region can be supplied by gas pipelines. Huge tankers help out by transporting liquefied natural gas (LNG) all over the world by sea. The processing equipment needed can be carried by heavy-lift vessels (HLVs); these important cargo ships are vital to the growth of the natural gas industry

The transportation of liquefied natural gas is a business of vast proportions. Huge tankers carry LNG around the globe. The imposing steel hulls of these ships often measure 300 metres long – about the length of three football fields – and 50 metres in beam, so big that the Arc de Triomphe in Paris could easily be stowed in the hold. Some 180 LNG carriers are cruising the oceans at present. In the future, however, there will be many more because dwindling crude-oil reserves and rising prices are making natural gas a resource of increasing importance.

Liquefied natural gas will be the energy carrier of choice, above all in regions too remote to be linked by pipeline to the world's great natural gas reserves – the USA for example. The advantage of LNG is that, at a temperature of minus 163 degrees Celsius, it is 600 times denser than in the natural form. Therefore occupies a much smaller volume for its transport. E.A. Gibson, a respected London-based shipbroking company, estimates that the world LNG market, which stood at 142 million tonnes in 2004, will more than double to 346 million tonnes in the year 2015. Gibson predicts that more than 350 ships, twice the present figure, will be needed in 2015. So it comes as little surprise to learn that the major builders of LNG tankers have full order books. In the 1980s, most LNG carriers still came from European shipyards; today's biggest builders are in Korea and Japan. The Koreans have now become the leaders in LNG carrier construction. With Daewoo Shipbuilding & Marine Engineering, Samsung Heavy Industries and Hyundai Heavy Industries, South Korea now boasts the three most important manufacturers of LNG carriers in the world. Each of these concerns is now launching at least seven new LNG tankers annually.

As Technically Sophisticated as a Spaceship

LNG carriers come in two basic forms: Moss tankers with spherical reservoirs, and membrane tankers. The Moss sphere is the conventional design and the one used more frequently. Huge aluminium spheres up to 40 metres in diameter rest inside the ship's hull. The optimized spherical shape makes these containers inherently stable and so they can be made from thin material – just four centimetres of aluminium – without additional reinforcement. In comparison, scaling a chicken's egg up to this size would result in a shell at least 30 centimetres thick. With added insulation, this layer of aluminium is enough to keep the LNG at a temperature of minus 163 degrees Celsius. The newer membrane carriers take a different design approach, using double-walled tanks. The innermost layer is most commonly a metal membrane 0.7 to 1 mm thick, which seals the tank. Behind it is an insulating layer made from a material such as plywood or balsa. Insulation performance is improved by the addition of a second layer of aluminium, glass fibre and polyurethane to make a sandwich. Shipyards are now building more membrane carriers than Moss spheres, on the strength of a Hyundai Heavy Industries study that found a gain of as much as eight percent in LNG capacity for membrane carriers over aluminium sphere vessels of equal size.

The construction of membrane-style carriers is a high art, "comparable with building a spaceship," says John Holland, Head of the Project Management Department in the Maritime Services Division of Germanischer Lloyd in Hamburg. The membranes must be fabricated and welded to millimetre precision. Corners and edges are made so that they can expand and contract without cracking when wide temperature swings occur. What is more, the now used for the membranes types of steel vary little in their thermal expansion coefficient between 20 above and 163 degrees below zero Celsius. These quality grades include Invar steels, such as those employed in tankers of the Gaz Transport design.

250,000 Cubic Metres of LNG per Carrier

An average carrier now has a capacity of some 150,000 cubic metres of LNG. Growth in the business, however, has led to orders for vessels having cargo capacities as large as 250,000 cubic metres. And these have some technical peculiarities. Unlike all other merchant vessels, LNG carriers usually have steam turbine propulsion. Their boilers are fired with boil-off gas (BOG) – that is, gas vaporized from the LNG being transported. As a rule, 0.15 percent of the cargo boils off every day. LNG carriers in the past have thus powered their machinery by feeding off their own cargo. In the new supercarriers, however, more BOG is generated than the propulsion system can possibly use, and so these vessels will be equipped with reliquefaction plants. High-efficiency, slow-speed diesel engines will provide the motive power. "Reliquefaction systems have generally been too expensive," says Holland. "On the one hand, they have a high first cost; on the other, their compressors consume about five megawatts of electric power." But it will pay to install these systems in the new generation of 200,000-plus cubic metre carriers. Holland thinks that reliquefaction plants will soon become established and that their costs will drop in the future until they are economical even in smaller carriers.

The picture of maritime LNG trading is not completed solely by LNG carriers, though. Also prominent are the heavy-lift vessels (HLVs), which can transport extraordinarily heavy cargoes. This class of ship, as impressive as it is unusual, was used in bringing plant components for the Melkøya Island LNG terminal to Hammerfest from the yards where they were built in Cádiz and Antwerp. Last summer, the "Blue Marlin" sailed from the Netherlands to Cádiz, where it picked up the 35,000 tonne process barge, a key component of the new terminal. "Blue Marlin", one of the world's largest HLVs, has a cargo deck measuring 178 by 63 metres. While loading, the ship partially submerged itself so that, for a short time, only the superstructure was visible above the water. Tugs then manoeuvred the barge above the deck. When the HLV pumped out ballast and resurfaced, the barge rose along with it. Yard workers then welded some 60 "scotches" (retaining wedges), each a metre and a half tall, onto the sides of the barge to keep it from shifting in heavy seas. This done, the vessel sailed to Hammerfest, a voyage of 2,700 nautical miles, where it repeated its submerge-and-surface cycle to unload.

HLVs have been deployed primarily in high-seas operations; the erection of offshore drilling platforms is one example. But these workhorses of the sea can transport other kinds of burdens: cranes, entire warships or, for that matter, up to 15 motor yachts at a time. The voyage to Melkøya shows that these gigantic carriers will be able to carry out quite different tasks in years to come, and are destined to become a pillar of the future LNG industry. ■ TS

Reprint „Linde Technology" Customer Magazine Linde AG

With the Moss tankers, the aluminium containers only need a wall thickness of 4 cm, thanks to their spherical shape

News from Industrial Services

CAIRO

New Projects in Deep Water Gas Development

To accommodate the expansion of high quality surveying activities in Egypt, including an increasing number of senior inspectors, Germanischer Lloyd Industrial Services opened a new, larger office in Maadi, Cairo. The opening of the new office was attended by special guests, including Petroleum Minster advisor Mr El Gindy , Burullus chairman Dr Sussa, BP Egypt chairman Mr Mekaway. With experts from Germany, Malaysia, India, Singapore, Britain, Venezuela, Brunei and Egypt, the staff of Germanischer Lloyd offers broad expertise in the industrial sector in Egypt. Germanischer Lloyd Egypt has recently been awarded independent verification, certification and quality surveillance tasks for both the Burullus Deep Water Gas Development Phase IV and Rashpetco Rosetta Phase III deep water gas development projects. The company has obtained a contract to provide Marine Warranty Survey services for three new offshore platforms and several pipelines. This project is ongoing after PETROBEL extended its validity until 2006 to cover another offshore platform and three pipelines. Providing Asset Integrity Management services to GUPCO, the biggest oil producer in Egypt, is another project of the GL Industrial Service Egypt. Apart from industrial services, Germanischer Lloyd offers ship classification and engineering services for vessel newbuildings and fleet in service.

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CONFERENCE

Innovations in Welding Technology

The welding of high-value materials to form complex structures requires great attention to quality: in view of the rapid growth in the size of the ship and the increasingly intricate designs of structures and bridges, ever-growing demands are being made of the technology. By invitation of Germanischer Lloyd, the German Welding Society (DVS) and the Welding Training and Research Institute North (SLV-Nord), a large number of experts from industry, science and services met in Hamburg for the 7th Special Seminar on "Welding in Civil Engineering and Shipbuilding" in May 2006. The agenda included papers on the international materials specifications and the material requirements in the field of tension between manufacturers and practitioners. The next conference for "Welding in Civil Engineering and Shipbuilding" will take place on 25/26 April 2007 in Hamburg.

CONGRESS ON

"Product and Systems Certification"

Outstanding quality and precise documentation of the production process are amongst the chief long-term advantages in global competition. Latest developments and current prospects in product and systems certification were in the spotlight for the congress of the same name, which took place on 16/17 May 2006 in Hamburg. On the welcoming evening, Prof. Dr Straubhaar, Director of the Hamburg Institute of International Economics (HWWI), gave an address on the global competition amongst industrial locations. Speakers from the worlds of commerce and science and trade presented exemplary methods for quality assurance in shipbuilding, aircraft manufacture and automobile production. The specialist conference was convened jointly by the German Accreditation System for Testing GmbH (DAP), Hamburg branch office of VDI (the Association of German Engineers) and Germanischer Lloyd Certification (GLC).

Dr Hermann J. Klein, Member of the GL Executive Board

Germanischer Lloyd WindEnergie (GL Wind) offers an efficient, flexible and economical method for performing a rotor blade survey: inspection by means of rope access technology (RAT). For offshore installations, the activities involving the inspection, assembly, repair and maintenance of rotor blades are only possible by rope in the first place.

GERMANY

Faster Approval Procedures

With the entry into force of the new Hamburg Building Regulations on 1 April 2006, the wind energy division of Germanischer Lloyd is now authorized to grant type approvals for wind turbines. With immediate effect, approval procedures for all new types of wind turbines can be processed much more rapidly and economically. Owing to the stringent technical requirements for the operational reliability of wind turbines, Germanischer Lloyd is conducting a thorough assessment of the manufacturers' design documents and technical drawings. This assessment includes an evaluation of the wind zone/class or location, the dimensions of the installation and turbine components as well as the control system parameters, as specified by the manufacturer. Here Germanischer Lloyd is performing an independent, almost completely new calculation in parallel, involving the load assumptions, the electrical installation, the mechanical engineering, the safety system, the rotor blades and the civil works. Supplementary examinations by the Building Regulations Authority are then no longer required. Thanks to the new Building Regulations, the costs of the approval procedure are reduced and the examination and approval process is speeded up appreciably.

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WINDTEST

Occupational Health & Safety Management System Certified

Testing the wind is always a challenge – chiefly technologically, but also in terms of safety. Owing to the appreciable hazard potentials involved when working on wind turbines and measurement masts, workplace safety has been a firm part of company policy at WINDTEST Kaiser-Wilhelm-Koog (WTK) since its establishment. The declared objective is to prevent all accidents and occupational illnesses of the employees. At regular intervals, the engineers and staff of WTK receive training in first aid, high-altitude rescue, offshore procedures, and safe operation and driving. These courses also include the handling of electrical systems and appliances, use of the personal protective equipment against falling and, as of recently, occupational health and safety documentation. To be able to provide evidence of these wide-ranging safety measures to external bodies, WTK had its occupational health and safety management system, which is based on the existing quality management, certified according to OHSAS 18001:1999. A project in respect of work safety is also under consideration. If necessary, new hazard and impact assessments or operating instructions will be compiled.

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INTERNATIONAL GRID CODE COMPARISON

Keeping track

The grid codes for wind turbines differ from one country to another. In Germany alone, there are five sets of regulations, which are constantly added to and revised. The situation is similar in Anglo-Saxon countries. The wind energy division (GL Wind) of Germanischer Lloyd is now offering a comprehensive overview of the grid codes in the various countries applicable for manufacturers and operators. The "International Grid Code Comparison (IGCC)" records all the access rules of European and also non-European countries and presents an overview of the different requirements set by the system operators. The new service from GL Wind includes both a detailed list of the conditions that apply within the countries selected by the customer along with optional monthly updates.

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Trade Fairs

JUNE

19.06. - 23.06.2006, Moscow
Neftegaz
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Sakhalin is a large island in the Northern Pacific, almost 950 kilometres long and up to 170 kilometres wide. It belongs to Russia, but is over 10,000 kilometres away from Moscow. A cold and bleak region to which the Czars used to banish only its convicts. A region which is often beset by earthquakes, like the one on 28 May 1995, when a quake with a strength of 7.5 on the Richter scale devastated the city of Neftegorsk. However, some of Russia's most significant oil and gas reserves are to be found on and around Sakhalin: a coastal area of 20,000 square kilometres is believed to hold reserves of 700 million tonnes of oil and 2500 billion cubic metres of natural gas. In view of the rising oil prices, developing this field is becoming more and more attractive. And, above all, it is now becoming feasible in the first place – as a result of the latest technologies, which are also safe and reliable, thanks to the know-how provided by Germanischer Lloyd Oil and Gas GmbH (GLO). There are now diverse oil projects underway around the island; the technologically most complex of these, Sakhalin II, is being pushed forward by the Sakhalin Energy Investment Company Ltd. (SEIC): over 20 billion US dollars will be invested here by this consortium, which consists of the companies Shell, Mitsui and Mitsubishi. Since last year, the Russian gas corporation Gazprom has been negotiating an entry into this attractive project; for the first time, liquefied natural gas (LNG) is to be delivered by Russia to the booming economies in Asia and the US West Coast.

The region is so inhospitable that the oil deposits at sea must, in part, be accessed from the coast with the aid of horizontal drilling, as is the case for the Sakhalin I project, for example. Molikpaq, the first Sakhalin II platform, has no pipeline connection with the island so far: since 1999, oil has been produced on Molikpaq (Phase 1) and then bunkered until it can be transferred to tankers. However, the tankers are unable to dock at the platform for about five months a year, owing to the heavy ice cover. At some places on the island, there are annual average temperatures of 0.5 degrees Celsius, dropping as low as minus 45 degrees in January, and the sea is frozen over for several months of the year. Oil loading and hence oil production is then impossible.

But now a new era in technological innovation is dawning: Sakhalin II has entered its Phase 2, where the aim is to erect two new platforms connected to a pipeline network, with which it will be possible to produce oil continuously on 365 days a year. GLO will class both of these offshore platforms, which is an indispensable prerequisite to ensure that SEIC can receive flag state registration combined with internationally secured ownership rights to its installations.

Two platforms are being installed far north in the polar ice: LUN-A produces gas, PA-B mainly oil

Producing Oil in Gruelling Conditions

Two New Platforms under Construction

The Lunskoye platform (LUN-A) some 15 kilometres off the northeast coast of Sakhalin – with a water depth of 48 metres – mainly produces gas with low levels of condensate. This gas is conveyed via a large onshore pipeline to an LNG installation in the southern part of the island. The processed and liquefied gas will then be transported to Japan and the US West Coast by LNG tankers docking at an export terminal in Aniva Bay, which is generally ice-free throughout the year. Even farther north than LUN-A, the Piltun-Astokhskoye-B platform (PA-B) will be installed in water 30 metres deep to produce chiefly oil. For this field too, pipelines will be built to transport the oil and gas to the south of the island. Both pipelines will be 800 kilometres long, with 126 kilometres crossing inaccessible marshland. In addition to classification of the two offshore platforms, the tanker loading unit for the oil in Aniva Bay, an offshore tower in 30 metres of water with a swivelling loading arm, was also certified by GLO.

"The unusual feature for these gigantic offshore platforms," explains GLO project manager Jan Zschommler, "is that they each consist of a concrete substructure and a superstructure which is the actual platform, known as the topside. The first topside will be mounted onto the substructure in June, as part of an extraordinary manoeuvre." The substructure itself consists of four concrete legs with a diameter of 25 metres anchored in a concrete base 100 metres square and 13 metres thick. These units (LUN-A 103,000 tonnes, PA-B 90,000 tonnes!) have already been brought to their destinations by tugs from the Russian manufacturing facilities in Nahodka and successfully sunk in the sea by ballasting; all they are waiting for now is to receive their topsides. These are currently still under construction in the yard at Samsung Heavy Industries (SHI) in South Korea.

"Such substructures are normally made of steel mounted on piles," explains Ulrich Hachmann, Head of the Department for Offshore Structures and Installations at GLO. However, owing to a number of factors – like the seismic activities, the ice loads and the local production capacities – SEIC decided in favour of a heavy concrete structure. In view of these facts, even the topsides are designed to be particularly massive: "Because of the extremely rough environmental conditions in this region, large parts of the platform had to be cladded for their own protection. In general, all accommodation and processing areas must be concentrated in one unit. All this leads to truly gigantic dimensions and enormous masses for the steel construction and equipment. The larger of the two topsides will weigh over 28,000 tonnes."

An international inspection team checks the plants. Only when this difficult manoeuvre has been completed and both platforms are able to commence production successfully will GLO issue the class certificate for the Sakhalin II platforms LUN-A and PA-B

For months on end, the GLO experts in Hamburg were busy with the assessments of the ice and seismic loads. The structures designed by the reputed Norwegian engineering office Aker Kvaerner were checked independently by a GLO team; all technical aspects of the two platforms that were relevant to safety were examined thoroughly. The result: no excessive loads were detected, and the design by Aker Kvaerner and AMEC was approved.

Topsides on the Way to Sakhalin

At present, the GLO experts are concentrating their efforts on the construction phase of the topsides: just as for the construction of the concrete substructure, GLO surveyors are currently monitoring the work at the Korean yard to ensure that the previously approved drawings are executed correctly. By the beginning of the year, about 15,000 of the total of 113,427 prefabricated pipe sections – known as piping spools – together with 100,000 cable termination points had been processed for the LUN-A platform. The highlight of the surveying work is expected to come at the end of June: the first of the two 30,000 tonne topsides (for LUN-A) will be floated to Sakhalin and deposited on the concrete legs. During this operation, care must be taken to ensure that neither substructure nor topside is damaged. Special transport barges have been built, with immense flooding valves to permit rapid and precise lowering of the structure. The seismic mount (a "friction pendulum bearing") to be installed between topside and substructure also deserves mention. Its purpose is to make sure that the seismic movements of the earth, and hence also the concrete base, are not transmitted directly to the topside. This seismic mount is intended to protect and decouple the platform from the substructure during an earthquake. Such quake absorbers have already been successfully used for the construction of buildings and bridges in the USA; they will be given their offshore premiere in Sakhalin II. No wonder that the offshore trade will be watching Sakhalin with great interest in June, says Jan Zschommler. And only when this difficult manoeuvre has been completed and both platforms are able to commence production successfully will GLO will issue the class certificate for the Sakhalin II platforms LUN-A and PA-B. ■ CG

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Hawsers in new waters

Using laboratory tests and field performance data, Germanischer Lloyd Bautechnik has developed a programme to determine the condition of hawsers deployed at a unique offshore coal transfer facility in Turkey's Bay of Iskenderun.

ISKEN AS, the Turkish affiliate of Germany's STEAG power generation group, has chosen a unique cargo-handling system for coal deliveries to its 1,210 megawatt (MW) power station in the Bay of Iskenderun. The $1.5 billion, bituminous coal-fired station represents not only the biggest investment project in STEAG's history but also the greatest foreign investment in Turkey to date.

Because the water alongside the plant's coal jetty is not deep enough to accommodate the large bulk carriers needed to keep the complex supplied with the 3.3 million tonnes of coal it requires each year, ISKEN has opted for an innovative solution using an offshore coal transfer station.

Two to three times a month bulk carriers of approximately 170,000 dwt arrive at the facility's floating crane platform, or transshipper (TS), which uses its three luffing cranes and conveyor system to transfer coal from the bulk carriers to two self-unloader barges. The two barges, which are also equipped with a conveyor system, are then pushed by tugs from the location of the transhipper to the shoreside jetty to discharge the coal to the power plant.

Barge with conveyor system

The ISKEN power station started commercial operations in November 2003 and in February 2004 the complex was formally inaugurated by the former German Chancellor Gerhard Schröder and the Turkish Prime Minister Recep Tayyip Erdogan. It is expected that in future bulk carriers of up to 240,000 dwt and 320 meters in length will be accommodated at the TS.

Mooring systems

Three single point mooring (SPM) systems have been provided for mooring the two barges and the transhipper (TS) in position at the offshore site in the Gulf of Iskenderun. The overall mooring system, including the three SPMs and the three hawsers (Length = 270 m; diameter = 160 mm) connecting the SPM buoys with the TS and the two barges, has been approved and certified by Germanischer Lloyd Oil and Gas (GLO).

Matthias Laatsch, the GL project engineer from GL Bautechnik, responsible for the hawser project, explains, "Because the Iskenderun coal transfer station is the first such offshore facility in the world, where the hawser is permanently (24/7) subjected to the environment (seawater, wave forces, sunlight, etc.) Germanischer Lloyd Bautechnik has been entrusted with establishing a hawser monitoring system.

"The aim of the project has been to develop criteria for determining the most appropriate time to replace an existing hawser with a new one. The results of the testing programme carried out by GL Bautechnik have also proved useful in determining what is the most appropriate hawser configuration for the Bay of Iskenderun offshore coal transfer station."

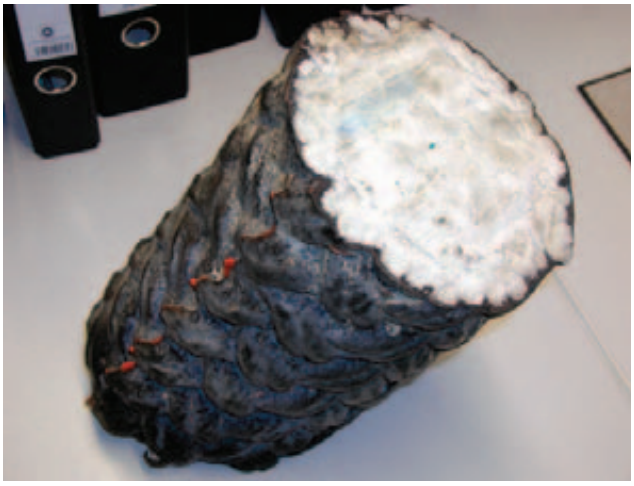
Test procedure

Initially, the installed hawsers and SPMs were certified by GL Oil and Gas and issued with an appropriate certificate prior to installation. Following this, GL-Bautechnik together with the owner developed an approriate monitoring system by using common hardware to record load cycles over a period of time and monitored the performance of the hawser system, including with a set of test ropes incorporated into the system. The results were taken to establish a computer model as a so-called hawser condition programme for Iskenderun.

Datalogger and power supply to record the load data

Single point mooring buoy

Transhipper in the Gulf of Iskenderum



Sample of the 270 m long used hawser diameter 160 mm

The dynamic sea loads acting on the offshore facilities arise as a result of the effects of the wind, waves and prevailing currents in the bay. In addition to these loads, the hawser is also subjected to a range of environmental influences, including the effects of carbon dioxide, ozone, temperature variations, ultraviolet radiation, salt water and marine growth.

Condition programme

"As a result of our performance monitoring and hawser testing activities, Germanischer Lloyd Bautechnik developed a robust computer tool, based on an Excel spreadsheet, for determining the condition of the Bay of Iskenderun hawser system over a period of time," explained Matthias Laatsch. One major part of this tool was the establishment of individual S-N-curves (Wöhlerlinien) together with the RWTH Aachen. Also an evaluation software containing so-called 'rainflow-Algorithem' to evaluate the load history was tailored especially for the application.

"In effect, the spreadsheet calculates the theoretical remaining strength of the hawser, based on data recorded by an SPM-mounted load monitoring device. Such residual strength determinations are not intended to replace the regular inspection intervals specified by the hawser`s manufacturer Marlow Ropes, but to complement them. Our programme enables ISKEN to assess variables such as in-service time, the hawser`s diameter and the residual breaking load of the hawser for a given overall safety factor."

The hawser condition programme developed by GL Bautechnik has shown that the impact of the environment, in the course of the observed time, is very much greater than that of sea loads on the life cycle performance of the hawser. As one result, the society has advised that further research should be carried out to assess the impact of the various environmental influences, including ultraviolet radiation, salt water and marine growth, in order to discover what might be appropriate protective measures. ■ MC

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At the HELMEPA training (f.l.t.r.): Dimitrios Sariklis (GL), Athanasios Reisopoulos (GL), Costantina Mitsatsou who is leading the HELMEPA Juniors, IMO Secretary General Efthiminos E. Mitropoulos and Dimitris Mitsatsos Director of HELMEPA

A Question of Honour

George Livanos' great inspiration was his love for the marine environment. When he fouded the Hellenic Marine Environment Protection Association (HELMEPA) in 1982 to pursue his goals, he could not have know that by the year 2006 exactly 12,716 seafarers, 453 ships, 100 ship-management companies and 114 associate companies from the shipping industry would join him in eliminating ship generated marine pollution and enhancing safety at sea. His emphasis on education rather than regulation was shared by many responsible business representatives. His successors as Chairmen of HELMEPA were all important Greek shipping personalities including Dr Basil Ph. Papachristidis, Cpt. Vassilis Constantakopoulos, Peter G. Livanos, Nikolas Tsakos and recently Nik Papadakis who is also the INTERCARGO Chairman. The example set by HELMEPA has already also been adopted by sister organizations in Cyprus (CYMEPA) and Turkey (TURMEPA).

"Meeting the Challenge of Safe, Secure and Efficient Ships in Clean Seas" is the name of the HELMEPA training supported by Germanischer Lloyd with four speakers: Dr John Kokarakis, John Validakis, Dimitris Sariklis and Agamemnon Apostolidis, naval architects and experts from the Piraeus based bulker and tanker expert team, present safety of navigation, marine coatings, ballast water management and damage stability.

But HELMEPA activities are not limited to experienced seafarer: To nurture an environmental consciousness already in young children, HELMEPA has set up a separate schoolchildren's voluntary environmental hands-on programme called HELMEPA JUNIOR. The events are aimed at schoolchildren aged 6-13 all over Greece. In 2006, the HELMEPA Junior group will organize an exhibition of children's paintings. These pieces of art will be hosted in Hamburg at the headquarters of Germanischer Lloyd as one more act of support and partnership between GL and HELMEPA. ■ AA/SN

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