DNV·GL

BULK CARRIER UPDATE

2016

New working group

DNV GL in Germany

Sharing experience

ESL – double debut

CONTENT

Cover photo: Christoph Papsch

Morten Løvstad
DNV GL Business Director Bulk Carriers
morten.lovstad@dnvgl.com

DEAR READER,

Welcome to this special SMM edition of BULK CARRIER UPDATE! SMM is without doubt one of the main events of the year for the shipping community. Shipping is still a person-to-person business, and SMM is an excellent place to network and close deals. We look forward to meeting up with you at SMM here in Hamburg, the home of our global maritime headquarters!

Germany is not only the premier container ship-owning nation but also home to many major bulk carrier owners and operators. We are proud to say that close to 60 per cent of the German-owned fleet and 24 per cent of German bulk carrier tonnage are classed DNV GL.

2015 was a difficult year for the dry bulk market, and 2016 started even more challenging, with both spot and TC rates well below break-even rates. In these demanding times DNV GL is determined to be a reliable and predictable partner who can help you stay competitive. Listening carefully to feedback from our customers, we identified a need for faster delivery of expert answers to customer enquiries. We therefore implemented our new 24/7, worldwide DATE service, enabling customers to contact technical specialists directly with a guaranteed answer within one working day. We also appointed ship type experts at all major bulk carrier hubs. Our ambition is to deliver the world's best technical support to our customers.

Cost-cutting measures may be necessary in today's market, but also constitute a risk of going at the expense of maintenance. DNV GL has therefore analysed big data from around 1,000 DNV GL-classed bulk carriers to extract a set of recommendations to help bulk carrier owners avoid costly deficiencies, losses and detentions.

DNV GL has taken other important steps over the last year to advance business for our bulk carrier customers. Learn in this issue why the Finnish owner ESL teamed up with DNV GL when ordering the world's first LNG-fuelled bulk carriers.

I hope you will enjoy reading this magazine, and I look forward to seeing you at SMM or at one of our DNV GL bulk carrier seminars around the world!

BULK CARRIER UPDATE

Published by DNV GL
Maritime Communications

DNV GL – Maritime
1322 Høvik, Norway

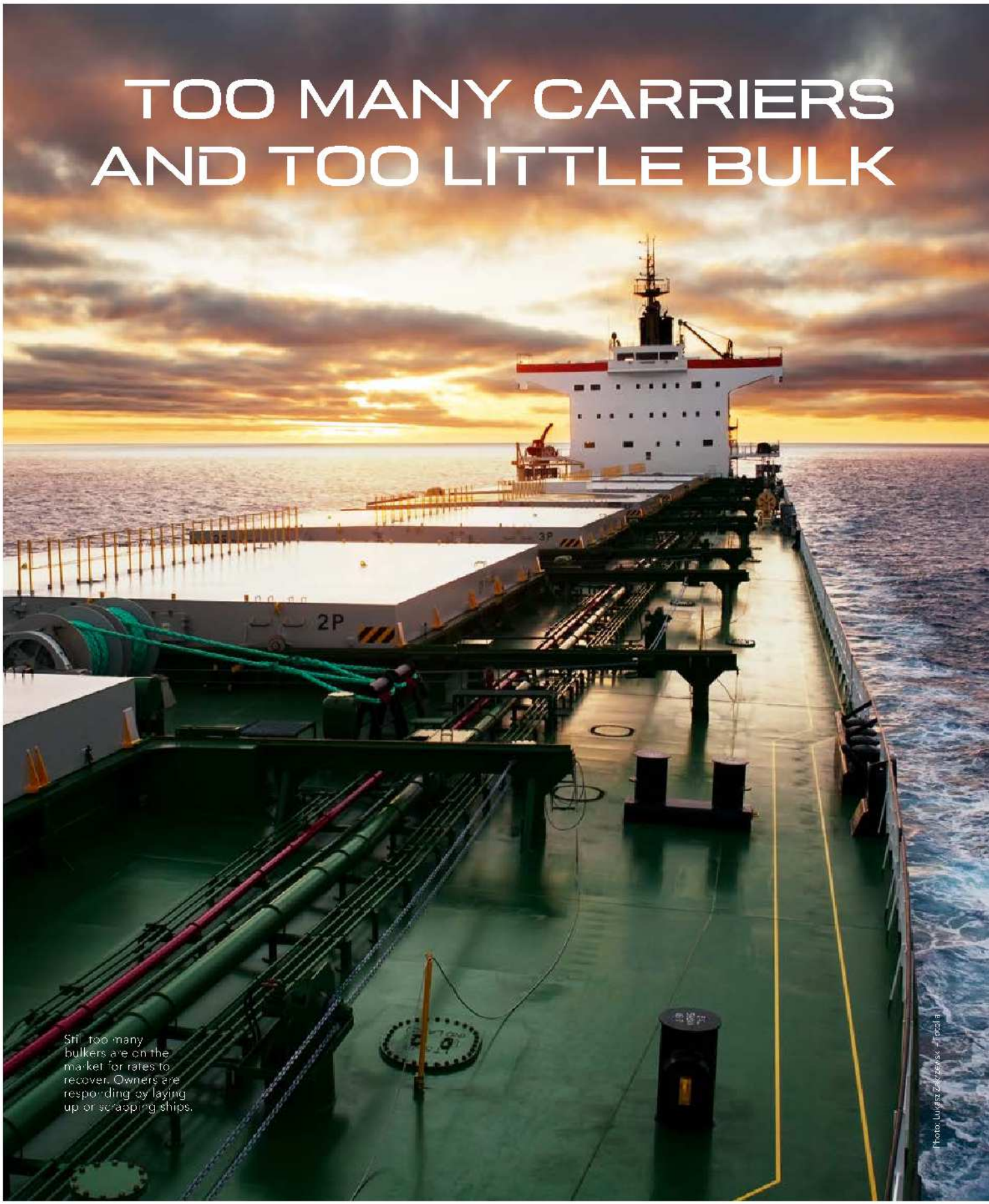
DNV GL – Maritime
20457 Hamburg, Germany

Additional authors:
Simon Adams (SA), Andreas Kühner (AK),
Alexandra Jane Oliver (AJO)

Design and production:
printprojekt, Hamburg

Layout: Lohrengel Mediendesign,
Hamburg

TOO MANY CARRIERS AND TOO LITTLE BULK



Still too many bulkers are on the market for rates to recover. Owners are responding by laying up or scrapping ships.

Photo: Lukasz Zarzewski / Focal Ia

The situation in the bulk carrier market continues to be characterized by an oversupply of ships and weak demand. Orders for new ships are being delayed or cancelled, while existing ships are laid up or scrapped. Ship prices as well as earnings are at an all-time low.

During the last few months dry bulk earnings have hit record lows and asset prices continue to fall. In an attempt to reverse these trends, owners are increasingly scrapping or laying up ships. At the same time contracting has almost stopped. With little sign of a pick-up on the demand side, the market seems to have reached rock bottom.

In February 2016, average bulker earnings reached a record low of around 3,700 US dollars (USD) per day and the Baltic dry index fell to 290 points. A five-year-old Capesize could be purchased for 23 million US dollars, the lowest level in almost 30 years. The newbuilding price for a Capesize is estimated to be around 45 million US dollars – nearly ten million dollars cheaper than at the beginning of 2015. Contracting activities have been extremely quiet during the first quarter with the exception of thirty 400,000 dwt Valemax deals signed between China's state-owned carriers and shipyards, all of which will be contracted on a long-term time charter to VALE.

A factor which helps reduce overcapacity is the growing number of delays and, in some cases, cancellations of newbuilding orders. Last year's "non-delivery" rate was 42 per cent measured in tonnage, and so far this year more than half the tonnage scheduled for delivery did not materialize according to the initial delivery plan. If we look at cancellations five years ago, approximately 21 million dwt of the tonnage that was scheduled to be delivered in 2011 was cancelled, followed by the same amount in 2012, and this number is anticipated to be surpassed in 2016 if delays and cancellations persist.

Lay-ups could see new record levels

In addition to a shrinking order book, scrapping has provided the fastest means of reducing the oversupply of ships with the amount of tonnage scrapped in 2015 reaching more than 30 million dwt. This included more than 80 Capesizes with an average age of just over 20 years. So far this year, more than 200 bulkers have been scrapped, removing 17 million dwt from the market. If this continues throughout 2016, the 2012 record of 33.4 million dwt will be beaten.

The number of lay-ups has increased substantially over the last few months. By mid-April, the total inactive fleet stood at almost 400 vessels compared to around 250 ships at the beginning of the year. The growing number of warm and cold lay-ups in Greece and Indonesia is seen as a way of bringing more balance to the market, especially for segments that continue to operate below cost, such as Capesizes and Panamaxes. In these times of volatile global markets, taking a ship out of service for one or several months may be the most profitable option until demand rises again.

To help shipowners and ship operators understand their lay-up options, DNV GL has developed an updated Class Guideline for vessel lay-up. The guideline informs about recommended practices gained from experience during the major lay-ups in the shipping industry of the 1970s, 1980s and 2009, providing a systematic and cost-effective approach to preparing a vessel for lay-up and maintaining it in a safe and optimal condition while inactive.

A slight gleam of hope

Last but not least, there is little evidence of an increase in demand for bulkers. Overall, global seaborne dry bulk trade is currently projected to remain static for all of 2016. Chinese steel production is expected to decline for the third consecutive year leaving little hope of an increase in the seaborne iron ore trade. The total seaborne coal trade is expected to decrease for the second year running, driven by dropping Chinese and Indian thermal coal import demand.

Muted newbuilding activities, an interesting second-hand market with brand-new ships being sold at discounted prices coupled with an increasing number of delays and cancellations as well as increasing scrapping activities are raising hopes for a better market. Some temporary freight rate improvements due to seasonal variations should be expected, such as during grain season. Smaller vessels from Ultramax downwards may fare somewhat better than the bigger ones thanks to their higher flexibility with respect to both cargoes and ports. On the other hand, the traditional Capes and the more specialized Newcastlemaxes may face some challenging times with iron ore volumes flattening out and coal volumes going down. Unfortunately it seems like the market will be stuck with the imbalance between a global surplus of bulkers and a weak demand side for some time. Most forecasts do not anticipate any significant improvements before the end of 2017. ▮ PP

DNV GL Expert
Pierre Pochard (PP), Senior Market Analyst
Market & Sales Intelligence
Phone: +86 186 0210 1271
E-Mail: pierre.pochard@dnvgl.com

WE IN GERMANY

A heavyweight in the global maritime industry, Germany is also a very important location for DNV GL, and a centre of excellence in terms of expertise and services.

The maritime community in Germany has for a long time sat at shipping's top table. As owners, builders, financiers, and innovators, German companies and individuals have had a notable impact on almost every aspect of the industry. Today, the German-owned fleet maintains its prominent position among the world's top five shipowning countries. Many of the world's top managing owners and shipping lines call Germany, the premier container-ship-owning nation, their home. Prominent bulk carrier owners and operators are also located in Germany.

This German maritime heritage is built into the very fabric of DNV GL, whose roots stretch back to 1867, the year Germanischer Lloyd was established in Hamburg. Today, DNV GL classes about 60 per cent of the German-owned fleet and 24 per cent of German bulk carrier tonnage. The heart of the country's

maritime industry, Hamburg has continued to be the centre for the DNV GL maritime operations after the merger between DNV and GL, and is home to its global maritime headquarters.

"More than 1,000 DNV GL experts based in Hamburg and in the field are working hard to support our customers and their fleets," says Matthias Ritters, Regional Manager Germany at DNV GL. Many of DNV GL's experts have gained experience in German yards, manufacturers, shipping lines, and shipmanagement companies and can draw on a wealth of local knowledge and contacts. Local customers find an unparalleled range of services at their Hamburg doorstep.

Superior technical and service range

"When it comes to annual surveys or port state control, class matters a lot. At DNV GL, we strive to minimize deficiencies and avoid detentions for our customers. Our database of nearly 13,000 ships delivers a unique collection of operational insights helping us to keep our customers' vessels afloat," says Hagen Kruse, Regional Chief Surveyor at DNV GL.

The Hamburg office is also where the 250 member DNV GL plan approval team works on newbuilding and retrofit projects from Germany and around the world. Relying on the new DNV GL rule set, the most modern and future proof worldwide, they ensure that DNV GL customers get the most out of every tonne of steel.

In an operational crisis the DNV GL Emergency Response Service (ERS) team stands ready to support owners and operators. More than 4,000 vessels rely on the global DNV GL ERS. The team consists of 17 people, with seven based in Hamburg >

Photos: DNV GL, HS-Photos/Depositphotos

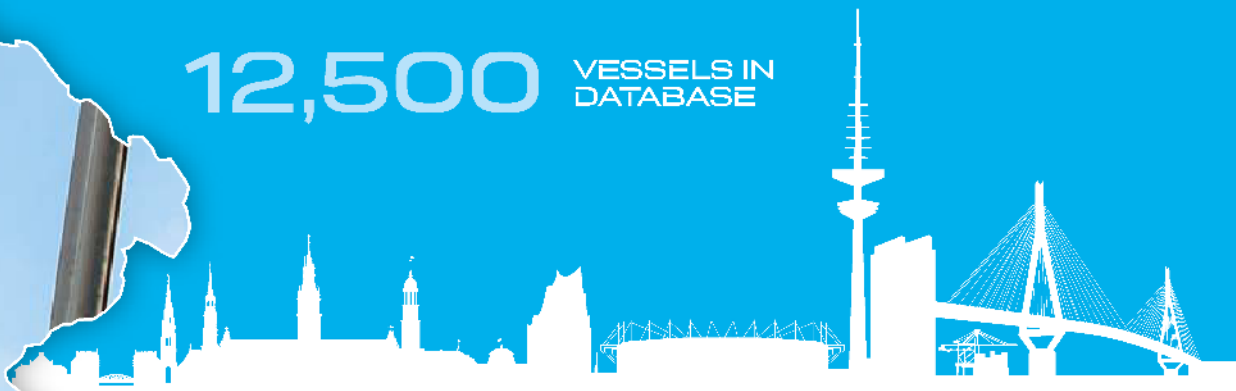
18 LOCATIONS IN GERMANY

250 PLAN APPROVAL TEAM MEMBERS

1,000 MARITIME EMPLOYEES

800 MARITIME EXPERTS BASED IN HAMBURG

12,500 VESSELS IN DATABASE



DNV GL's Leadership Team for Region Germany (from left to right): Matthias Ritters, Regional Manager, Sergey Gribanov, Team Leader Technical Service Management, Jörg Langkabel, Business Development Manager, Sönke Pohl, Key Account Manager Regional Business Development, Hagen Kruse, Regional Production & QHSE Manager, Principal Surveyor.

> and the rest in Høvik. One of the main operational safety concerns for bulk carriers loaded with mineral ores or concentrates is cargo liquefaction. "This issue has not yet been properly accounted for by international regulations. Many shipowners are concerned and have been asking for our support in preventing or dealing with this problem," says Sönke Pohl, Key Account Manager and Ship Type Expert for bulk carriers at DNV GL in Germany.

To help customers tackle this issue, DNV GL has developed a guideline for the design and operation of vessels with dry bulk cargo that may liquefy. The guideline helps customers assess the structural strength of their vessels (e.g. ore carriers) to avoid complications arising from cargo liquefaction by taking preventative measures at the design stage. The publication also sets out circumstances which call for third-party assessments to check the condition of the cargo prior to loading.

With specialists for every ship type, DNV GL has highly skilled and experienced experts to cover every niche. The German DNV GL offices have dedicated ship-type experts for bulkers, container ships, MPVs, gas carriers, naval vessels, LNG as ship fuel and inland water vessels as well as teams specializing in underwater vehicles, submarines, cruise vessels, yachts and many other fields.

Maximizing efficiency

The maritime advisory team in Germany comprises some of the leading experts in shipping efficiency and optimization. A dedicated fluid dynamics team based in Potsdam is able to generate and evaluate hundreds of thousands of hull forms systematically, modeling, varying and analyzing ship designs, based on a unique parametric approach. This allows the team to optimize hull performance as well as the performance of appendages, resulting in a hull shape and vessel design that offer the highest standards in efficiency and performance. For example, the hull line optimization of a 20,000 TEU container vessel series resulted in a reduced power demand of more than five per cent compared to the initial design and conventional lines, saving the owner up to one million US dollars annually per vessel.

> "Drawing on our tradition of service and our innovative vision, we are ready to meet the challenges of the market now and in the future."
>
> **Matthias Ritters**, Regional Manager Germany at DNV GL

The Hamburg headquarters are also the base for the award winning ECO Solutions team, whose ECO Insight tool has become the most widely used fleet performance solution worldwide, with more than 700 registered users. ECO Insight provides a comprehensive and easily accessible way to manage the performance of a fleet, including voyage, hull, propeller, engine and systems performance.

To perform the calculations underpinning these modern solutions, DNV GL utilizes one of the most powerful computing clusters available to the shipping industry, with some 8,000 processor cores operating in parallel enabling nearly 70 teraflops of computing capacity. Developed in-house, the simulation software

running on this supercomputer is among the best in the world, as international validation contests have shown.

Superior customer support

Hamburg is one of five hubs for DNV GL's Direct Access to Technical Experts (DATE) service. DATE is spread across all major time zones and has the capability to handle more than 4,000 questions or cases a month. The set-up allows DATE experts to address urgent requests within just a few hours. The other support hubs are located in Oslo, Piraeus, Singapore and Houston.

Hamburg is also home to a team of nine dedicated local technical support managers, providing personalized service to German shipowners and managers. "The combination of DATE and the dedicated local technical service enables DNV GL to provide tailor-made and quick support to our customers," says Sergey Gribanov, Team Leader Technical Service Management for Germany. "A team of dedicated key account managers is in constant exchange with customers in the region. Their insights into day to day questions and issues as well as the expertise provided by our Technical Support Unit (TSM) enables us to offer the best possible service to our customers", says Jörg Langkabel, Business Development Manager Region Germany, DNV GL.

DNV GL has also established a number of ship type specific working groups and forums to discuss common operational or regulatory challenges with customers and share best practices. The DNV GL bulk carrier forum meets twice a year in Hamburg. "These events are very important to us and we have received very positive feedback from customers. Our most recently established fixture is the Bulk Carrier Working Group, which had its first meeting in June 2016," adds Langkabel (for more information about the bulk carrier working group, see page 10).

Driving innovation

DNV GL is constantly searching for innovations which will take classification and the maritime industry further. Among the numerous DNV GL projects, both cooperative and in-house, that have helped advance shipping are joint industry projects (JIPs) to promote the use of LNG as ship fuel, AiPs and classification projects for the latest generations of new ship designs, new survey techniques to enhance transparency, a calculator enabling smooth low-sulphur operations, and ship simulations to optimize efficiency.

Digitalization is a key area for the industry's future. The new digital solutions and innovation team located in Hamburg is working on many projects, from applications helping owners assess their exposure to cyber-attacks to a new calculation tool and survey techniques to support DNV GL class services, through to data-enhanced services to boost operational efficiency, crew performance and safety.

"Drawing on our tradition of service and our innovative vision, we are ready to meet the challenges of the market now and in the future," says Matthias Ritters. "We hope you will join us to see how trusting DNV GL as your classification and advisory partner can ensure that your business operations are safer, smarter and greener - today and tomorrow." **SA**

DNV GL Expert
Matthias Ritters, Regional Manager Germany
Phone: +49 40 36149-8786
E-Mail: matthias.ritters@dnvgl.com

Photos: DNV GL

Cargo liquefaction is a major concern for the bulk carrier segment. DNV GL has developed guidelines for the design and operation of vessels with dry bulk cargo that may liquefy.

Sharing knowledge and experiences across the entire bulker segment benefits all stakeholders.

DNV GL LAUNCHES BULK CARRIER WORKING GROUP IN HAMBURG

DNV GL has recently established a bulk carrier working group as a forum for the German bulk shipping community. Ballast water management and cargo hold cleaning were some of the first issues discussed.

Sharing success stories and strategies for overcoming operational challenges with peers is key to advancing business in difficult times, says Jens-Michael Arndt, Managing Partner of the German shipping company H. Vogemann Reederei, and the newly appointed chairman of DNV GL's bulk carrier working group (BCWG). "We are normally competitors, but this group is a place where we can learn from each other and better understand our customers' problems and expectations."

The working group currently comprises participants from seven German shipping companies which control a combined fleet of almost 600 bulk carriers. "The group is open to additional members and participation is not limited to DNV GL customers. To provide additional input on common issues, DNV GL will invite representatives from regulatory bodies, industry associations such as the International Association of Dry Cargo Shipowners (INTERCARGO) or the Baltic and International Maritime Council (BIMCO), and technical experts as well," says Sönke Pohl, Bulk Carrier Ship Type Expert at DNV GL and Secretary of the BCWG.

In the group's June meeting a technical expert took centre stage. With the Ballast Water Management (BWM) Convention most likely being ratified this autumn and entering into force next year, the question of how to choose between different ballast water treatment technologies was one of the main discussion topics. "So far some 6,000 ballast water treatment systems have been sold globally and about half of them have been installed," says Kjetil Martinsen, Principal Engineer, Environmental Advisory at DNV GL.

No silver bullet

UV systems, which use a two-step process of filtration and ultraviolet (UV) irradiation to sterilize organisms and stop their reproduction, are among the most popular options at present. "UV systems are simple to operate and relatively easy to install. Some 3,000 have been sold, but as most of these were bought for installation on offshore supply vessels, this number may not necessarily be relevant for bulk carriers," Martinsen adds. Owners should be aware that there are uncertainties remaining regarding UV systems and the US Coast Guard's (USCG) acceptance criteria for approval.

With 2,000 units sold to date, electrolytic treatment systems are the second most popular option. By passing electric current through a small amount of seawater, they convert the salt, or sodium chloride (NaCl), into sodium hypochlorite, a disinfectant, which is then used to treat the ballast water. "This is a proven and

Cargo hold cleaning was one of the main topics at the first meeting of the bulk carrier working group in Hamburg.

Photos: Vogemann; Christoph Papsch

efficient method; the downside is that electrolytic systems are sensitive to low salinity and low temperatures so salt or a heating system must be added where necessary," says Martinsen.

"There is no silver bullet for ballast water management. DNV GL is currently working on a calculation tool to help shipowers narrow down the best options for their given vessels," says Morten Løvstad, Business Director Bulk Carriers at DNV GL. The DNV GL recommendations hinge on questions such as: What ship type is it? Does the vessel have to operate in fresh or brackish water? Does it operate in cold waters or in temperate conditions? Will the system have to work in high turbidity conditions, meaning water that contains a lot of clay, algae or silt? "All these questions are very important for making the right choice," says Løvstad.

A successful idea

Cargo hold cleaning, with a focus on the disposal of cargo residues and cargo hold wash water, was another topic discussed at the bulk carrier working group meeting in June. In the next meeting the working group plans to examine fuel oil standards and cybersecurity. According to Morten Løvstad, DNV GL plans to establish similar working groups in other important bulk carrier regions. "In a first step we will establish the same type of working group in Greece and Singapore. We are very pleased to see the German working group has generated so much interest so we intend to facilitate similar initiatives for owners and operators worldwide." ■ **AJO**

DNV GL Expert
Morten Løvstad (ML), Business Director Bulk Carriers
Phone: +47 975 63 009
E-Mail: morten.lovstad@dnvgl.com

PUTTING BIG DATA TO GOOD USE

Cost-cutting measures can go at the expense of maintenance. Based on survey and Port State Control findings, DNV GL has put together a set of recommendations for bulk carrier owners to avoid deficiencies, losses and detentions.

In challenging times like those the bulk carrier market has been experiencing since the end of 2008, no one has been spared from cost-cutting initiatives. However, cutting costs may result in lower maintenance standards in the bulk carrier fleet, which in turn can lead to more frequent class and Port State Control (PSC) deficiencies, and ultimately, detentions and repairs involving downtime which can be detrimental to business. DNV GL has used its big data capabilities to pull out operational experience data from the bulk carriers with DNV GL class, and is now sharing the main findings with its customers.

As a leading class, DNV GL attends to nearly 13,000 ships, including 1,000 bulk carriers, a fleet far bigger than that of any shipowner. Surveyors' observations have been combined with results from port state inspectors to build a unique collection of operational data and insights for the DNV GL-classed fleet. Realizing that the class observations on bulk carriers may be quite relevant for the day-to-day operation of these vessels, DNV GL put together a group of experienced technical experts from Classification Support at the Høvik and Hamburg offices to evaluate the data. Throughout 2015 the group worked on a project called "Sharing Operational Experience", gathering the latest DNV GL big data, holding technical workshops and using data analytics tools to identify what may be most valuable operational experiences to share with bulk carrier customers. The main findings are published in DNV GL's report "Sharing Operational Experience", which can be downloaded at dnvgl.com/publications, and several DNV GL seminars have been held to share these insights with customers to help them ensure safe and compliant operations at minimum cost.

Trends from Port State Control and class findings

More than 33,000 PSC and class findings from the last five years were analysed for the DNV GL bulk carrier fleet, equivalent to an average of 4.2 findings per ship per year. This is a relatively modest number; however, it does not reflect all class observations as many minor issues observed on board are rectified without being recorded. About 4,300 conditions of class (CC), conditions of authorities (CA) and non-conformities (NC) were analysed.

The main conclusions from the analysis can be summarized as follows: there is a slightly negative trend in the overall maintenance level. Over the past two years the number of conditions of class (CC) has increased; the number of postponed CCs has increased significantly. Among the instances of hull damage recorded, there were 1,508 contact damages and deformations, 2,677 corrosion areas and 1,168 cracks, with more than 30 per

cent found in the combined cargo and ballast holds. Non-conformities reached a peak in 2013 but declined thanks to a sharpened focus on risk management.

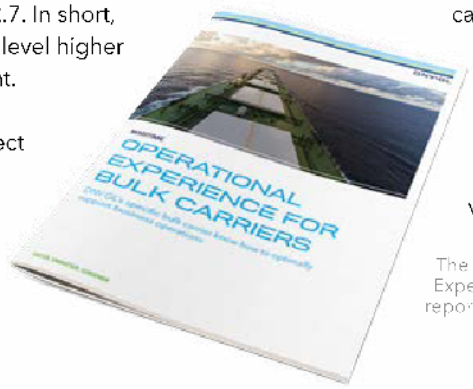
The analysis of the PSC inspections covers the fleet of conventional bulk carrier ESP ships; hence, forest product carriers, ore carriers, etc. are not included. The DNV GL study looked into 9,648 inspections resulting in 15,917 deficiencies and 205 detentions. The average number of inspections per year for the DNV GL bulk carrier fleet was 2.1 and the deficiency rate per inspection was 1.67, which is significantly better than the industry average, and actually better than for the bulk carrier fleet of any other class society. The detention rate has been fairly stable at about two per cent detentions per inspection. If we compare this with the worldwide PSC statistics, bulk carriers have a detention ratio of 2.7. In short, DNV GL customers have achieved a compliance level higher than the other players in the bulk carrier segment.

The top deficiency categories found by PSC inspectors on the DNV GL bulk carrier fleet reflect a well-known picture:

- Fire safety
- Safety of navigation
- Certificates and documentation
- Life-saving equipment

The deficiencies in these categories represent more than 50 per cent of PSC deficiencies, which corresponds to the general picture seen for the worldwide fleet. At the same time, looking at the top detainable PSC deficiencies, it can be observed that over the last few years there has been a much stronger focus on International Safety Management (ISM) Code compliance because of the New Inspection Regime (NIR) in the biggest PSC regimes (Paris and Tokyo MoUs).

When a DNV GL surveyor carries out an annual survey, he or she will, in addition to the class and statutory survey, perform an assessment of the maintenance level observed in four areas: the deck, accommodation, safety equipment and engine room. If a surveyor reports poor maintenance in any of these categories, the technical manager will be informed and there will be a dialogue on how to improve the situation. For the bulk carrier fleet, the maintenance scores worsened by about ten per cent from 2012 to 2015. There is relatively little variance between the four areas, but >



The results of the study "Sharing Operational Experience" have been published by DNV GL in report format and are shared in special seminars.

Photo: akiyuko - Shutterstock

> deck and equipment achieved the lowest scores and accommodation the highest ones. Looking at hull inspection results, key findings are related to maintenance, inspection and design issues. The following key points and trends were identified:

Anchor and chain loss

There has been a distinct increase in the number of anchor chain and anchor losses in the bulk carrier fleet in recent years. Winch break failures and detached D-link securing bolts are top technical failures. Roughly 50 per cent of anchor and chain losses appear to be related to operational issues, such as lack of knowledge about the environmental limitations of anchoring equipment, staying at anchor in overly heavy weather, anchoring in waters too deep, failure to secure the anchor chain properly while at anchorage.

Realizing the importance of the safety aspects and the high costs associated with anchor losses, DNV GL responded to these findings by developing a special awareness campaign jointly with Gard and Swedish Club. Training material has been developed for use by customers during officer meetings or other awareness initiatives and for self-training on board vessels. This topic will also be covered in greater depth in the next issue of BULK CARRIER UPDATE. For further information please visit dnvgl.com/anchorloss.

Damages to hull structure

The sides are a single-skin bulk carrier's most vulnerable elements. Damage records indicate that side frame deformation is the key challenge while corrosion is the second most frequent observation. On the other hand there is a positive trend in the number of reported cracks in main frames. The increased strength standard introduced by IACS Unified Requirement No. S12, with continuous brackets in the upper and lower end, is believed to be a significant contribution to the reduced risk of cracking. As mentioned above, the combined cargo and ballast hold is more prone to fatigue cracks, and the connection between the corrugated bulkhead and the upper and lower stool as well as the connection between the lower stool and the inner bottom plate are the most typical crack locations.

The hatch coaming with its end brackets is another area exposed to high risk of cracking, with a total of 163 findings of cracked and heavily damaged structures. Statistics show a significant peak of findings during third-renewal surveys.

Fire safety

Fire safety is of utmost importance for the protection of the crew, the ship and its cargo. Inadequate maintenance of fire safety equipment comprises the risk of PSC deficiencies and detentions, and issues related to fire safety are the most common findings on the DNV GL bulk carrier fleet, including fire detection and alarm systems, fire-fighting equipment, fire dampers, fixed fire extinguishing installations, and fire prevention structures.

Crew training a crucial factor

The common denominator for improving performance related to maintenance, hull and fire safety is to ensure that the crew is properly trained and that regular maintenance procedures are in place and adhered to.

ANNUAL SURVEYS PUT MAINTENANCE TO THE TEST

The DNV GL surveyor also assesses maintenance of the deck, accommodation, safety equipment and engine room.

A deformation in the hull side, for instance, could be modest, but it is essential for the crew to be trained properly in inspecting and reporting deformations of side frames which may severely affect frame strength. It is important to check whether the tug-reinforced areas are clearly marked; it might be advisable to expand these areas to mitigate the risk of contact damage and costly repairs.

Most of the maintenance deficiencies detected are related to equipment that needs regular maintenance and testing. Most companies have established maintenance systems, but the challenge remains to implement this in day-to-day operations. Customers are encouraged to review their planned maintenance systems (PMS) and implement them.

By focusing on the human factor and leveraging targeted campaigns to address the most frequent findings, shipowners can keep their costs under control and avoid downtime. ■ HS

DNV GL Expert
Håkon Skaret (HS), Senior Principal Engineer
Phone: +47 67 57 83 61
E-Mail: hakon.skaret@dnvgl.com

EXPERT GUIDANCE FOR VESSEL LAY-UP

Overcapacity and shrinking demand create an unfavourable climate for bulk carrier operation. DNV GL provides essential information on recommended vessel lay-up procedures.

In these times of volatile global markets, taking a ship out of service for one or several months may be the most profitable option until demand rises again. What was once a simple issue of finding a safe, sheltered mooring is today much more complex – a consequence of modern ship design and more elaborate regulations.

With over 13,000 vessels in class, DNV GL has the accumulated expertise and insight to advise shipowners on how best to lay up bulk carriers as well as all other ship types.

The shipowner has specific obligations towards stakeholders which need to be performed to ensure proper vessel lay-up.

Port authority requirements vary from port to port. For hot lay-up it is recommended to forward to the local port authority a lay-up plan for evaluation and authorization. For cold lay-up the owner should seek guidance from the vessel's flag state, insurer and local port authorities to agree on the final manning levels on board.

Practical checklist

Maintenance and preservation during the lay-up period is not a class requirement but will affect the scope of the recommissioning survey. If, during the lay-up period, the vessel has been preserved and maintained according to a programme accepted by DNV GL, the scope of the recommissioning survey will be adjusted accordingly.

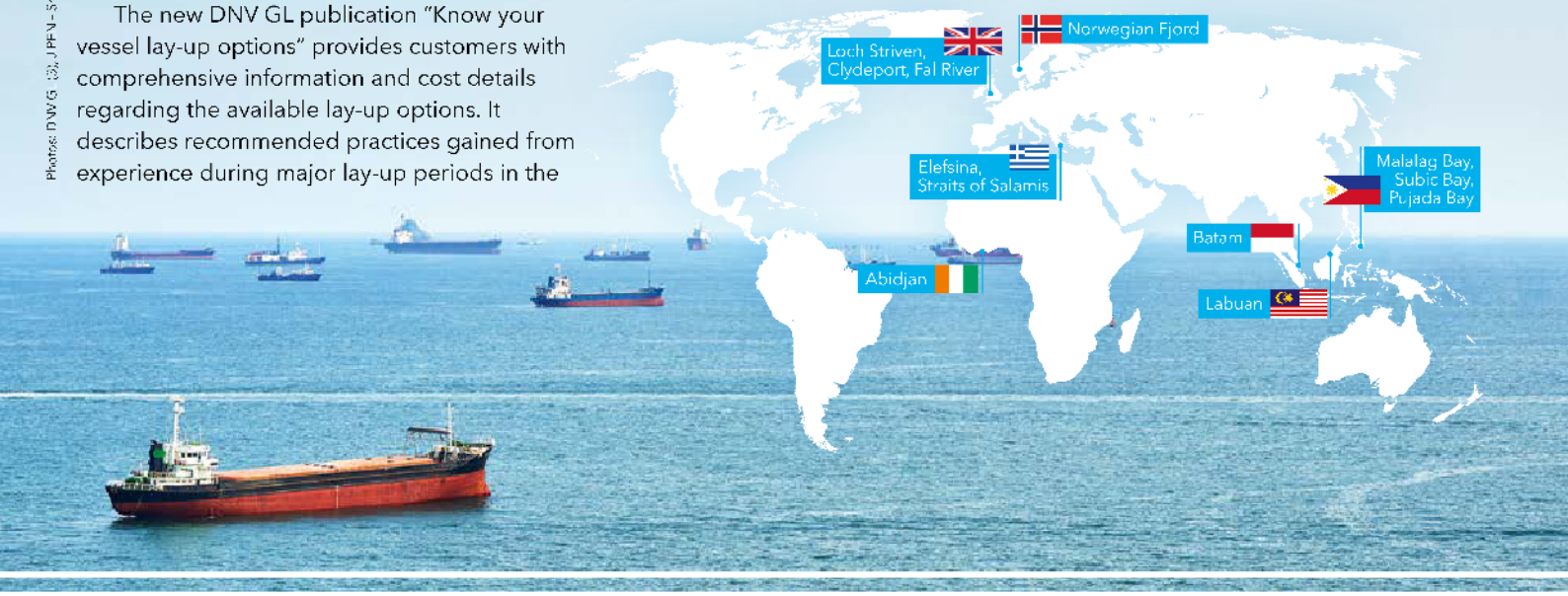
The new DNV GL publication "Know your vessel lay-up options" provides customers with comprehensive information and cost details regarding the available lay-up options. It describes recommended practices gained from experience during major lay-up periods in the shipping industry in the 1970s and 1980s and in 2009. The document explains a systematic and cost-effective approach for preparing a vessel for lay-up and maintaining it in a safe and optimal condition during lay-up, based on best practices. This publication supplements and acts as an overview of the key points found in the more extensive and newly updated DNV GL Class Guideline.

Customers will also find a practical checklist and a brief overview of services DNV GL provides to support smooth lay-up processes. The most recent version of the DNV GL Class Guideline for vessel lay-up is now available: DNVGL-CG-0290, January 2016 edition. In the publication "Know your vessel lay-up options", you will find a reference to the Class Guideline with more details. ■ RT

DNV GL Expert
Richard Tao (RT), Discipline Leader – Technical Operation Ship Life Cycle Management
Phone: +47 67 57 79 57
E-Mail: richard.tao@dnvgl.com

ESTABLISHED LAY-UP LOCATIONS – COLD LAY-UP

The locations shown represent just a small number of very well-known and established locations.



Photos: DNV GL, JPEN – Shutterstock

A NEW, FUTURE-READY STANDARD FOR SHIPPING

Since DNV and GL joined forces, a huge effort has been made to consolidate our existing knowledge and further enhance our standards to serve as a reference for the maritime industry. The know-how and experience of both legacy companies have been incorporated into the new DNV GL rules, which are now available to support state-of-the-art ship newbuilding and operation.

The new rules, which represent the best of the combined expertise and experience of two leading classification societies, have been evaluated for critical issues and improvement potential by our most experienced technical experts. The rule set, consisting of more than 20,000 pages, has been scrutinized with respect to clarity, practical application and how it contributes to the overall safety of vessels and thus supports safe and reliable shipping. The review has resulted in the most modern rule set published by any class society. The process has involved more than 200 technical experts in DNV GL and the rule set has been improved by extensive input from more than 800 shipyards, designers, shipowners and managers.

The total effort made to establish these rules is unprecedented in the industry and has resulted in a new rule set which is efficient, future-ready, consistent, transparent, modern and adaptable.

Harvesting operational experience

With around 13,000 ships classed by DNV GL, the experience we gain through supporting our customers in their day-to-day operations constitutes an unrivalled knowledge database. We continuously apply our experience in the development of our rules.

In connection with the development of the new DNV GL rules, we launched a research project in which we performed a thorough statistical review of our fleet. The aim was to identify possible areas where the rules could be further improved. More than 3,000 ships in service were closely monitored, looking for design-related defects. Typical defects and their frequency of occurrence were studied and the know-how achieved was incorporated into the new rules.

IACS CSR and DNV GL rules for hull structure

For most bulk carriers, the IACS Common Structural Rules (CSR) are applicable for the hull structure. However, the methodology as applied in CSR has been further developed in the DNV GL rules to cover all ship types. This includes other dry cargo vessels carrying bulk such as ore carriers, general cargo vessels, MPVs, Great Lakes bulk carriers and self-unloaders. This gives ship designers and shipyards the benefit of having to relate to one set of overall principles in their structural design, while ensuring that the special operational conditions for each of these ship types are taken into account.

A new and improved technical foundation

The introduction of equivalent design waves (EDW) in the DNV GL rules marks a significant change in the way dynamic loads are calculated. The advanced load concept is a major step towards a more realistic and accurate representation of the environmental loads.

Along with our state-of-the-art capacity models, this concept will increase the consistency in the safety level applied to the complete hull structure. In addition, this approach will accommodate challenges related to the development of innovative designs. This provides a foundation for an ideal distribution of structural strength, ensuring every ton of steel is used efficiently. Increased accuracy in the rules for loads and more advanced capacity formulations require more extensive computational capabilities. DNV GL rules are therefore supported by powerful software tools that ensure an efficient design process.

New and enhanced notations

To enable owners to efficiently customize vessels to their needs, the new rules offer a variety of additional class notations. These are tailored towards ship types and additional features, and ensure that vessels are designed and equipped for their intended

INDUSTRY INVOLVEMENT

The aim of developing the DNV GL rules was clear: to develop a unique rule set that meets the needs and expectations of the maritime industry. Stakeholders have been involved throughout the development and implementation phases. More than 800 leading shipyards, designers, manufacturers and shipowners worldwide have contributed more than 2,000 comments and items of constructive criticism, enhancing the quality and relevance of the rules.

A TOTAL REVIEW AND UPDATE

The development of the DNV GL rules presented an opportunity to completely review the entire rule book and look at how the rules are structured. The rules are in a more logical sequence now, complementing a typical design process. Documentation and certification requirements are clearly summarized in each part of the rules. This makes it easier to navigate and find what you are looking for. To give shipyards and designers starting out on a new project an easy entry point, all ship notations and specific requirements can be found in Part 5.

operations. In addition, they are made and continuously developed to support the application of the latest technology.

Gas ready and scrubber ready

As the regulatory and technology outlook can be complex and unclear, DNV GL offers "ready" notations to owners that want to prepare their vessel in the newbuilding stage for the future installation of new technology. By obtaining such a notation, owners can postpone initial investment costs while ensuring the necessary preparations are in place for a smooth and cost-efficient retrofit at a later stage. In addition, they may benefit from a higher degree of technology maturity (and possibly lower prices) on the actual installation date.

TMON (closed loop water) and TMON (open loop water)

The revamped class notations for water-lubricated tail shafts are another example of how we are now offering greater flexibility to ship owners. These two notations allow shipowners and operators the possibility of unlimited intervals between tail shaft withdrawal surveys of water-lubricated systems. With these two voluntary class notations, DNV GL is the first classification society to use a condition-monitoring-based survey process that eliminates the requirement for tail shaft withdrawal surveys at predetermined intervals. The notations can be assigned to both newbuildings and ships in service.

Photos: DNV GL, Jeroni nut, Fotolia

The maritime industry welcomes the new rules

"We have no doubt that the maritime industry will benefit from our new DNV GL rules," says Morten Løvstad, DNV GL Business Director Bulk Carriers. "We have already observed significant interest from yards and owners. In December last year, the first vessels contracted to the DNV GL rules were actually two innovative, LNG-fuelled bulk carriers for Finnish owner ESL Shipping. I am, together with our network of experts around the world, excited about and committed to supporting the industry in applying our new rules."

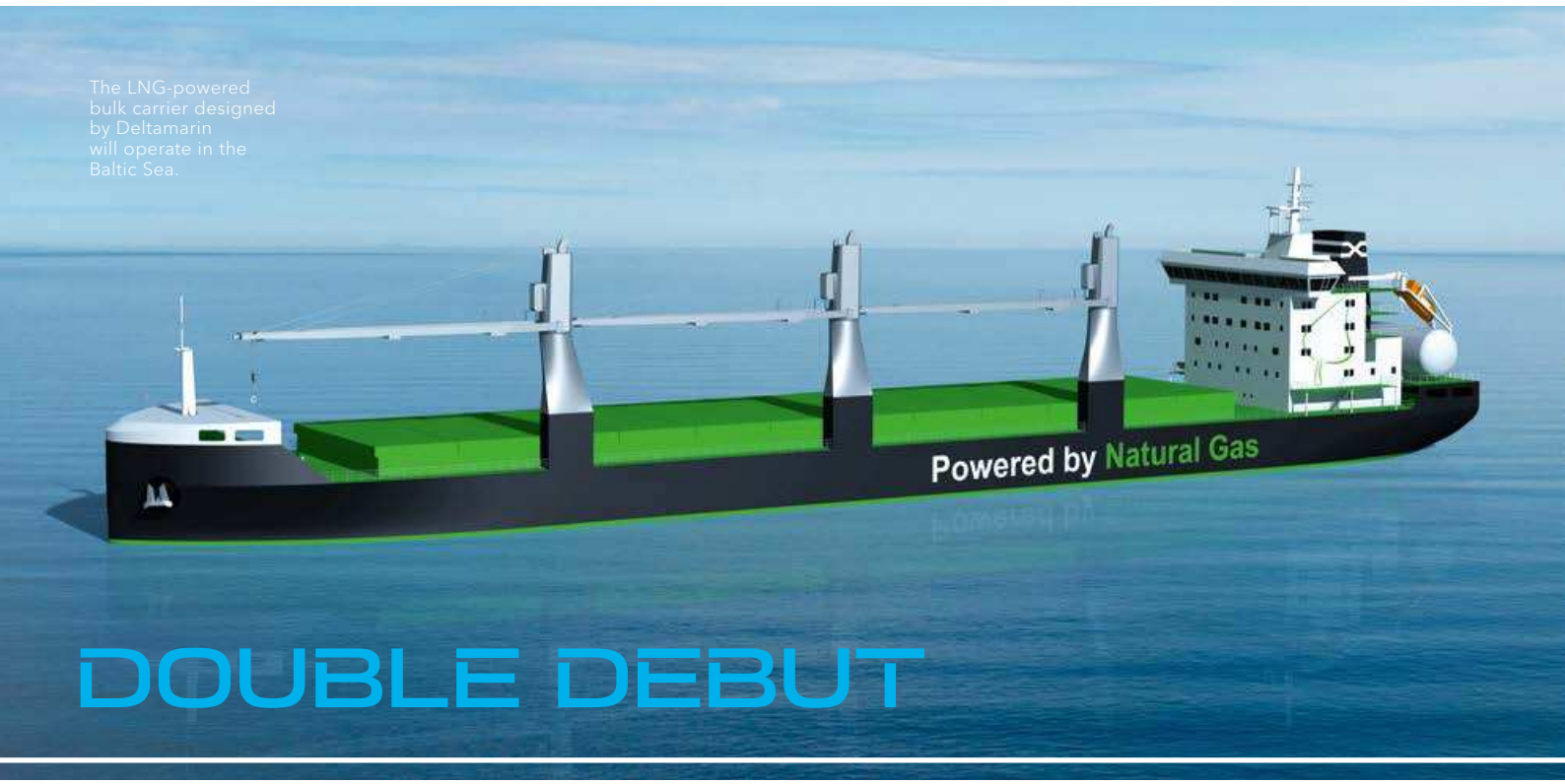
LNG-fuelled bulk carriers based on DNV GL rules

Featuring the Deltamarin B.Delta26LNG design, the two highly efficient ships will have dual-fuel main and auxiliary machinery, resulting in CO_2 emissions per tonne of cargo transported half that of present vessels. The bulk carriers will be built to the new DNV GL rules for general dry cargo ships with DNV GL ice class 1A and will have type C LNG tanks of approximately 400 m^3 capacity, enabling bunkering at several terminals within the Baltic region. The B.Delta26LNG has a shallow draft of maximum ten metres, an overall length of 160 metres and a breadth of 26 metres. ■ SS

CALCULATION TOOLS – FREE OF CHARGE IN 2016!

Calculation tools are essential for developing modern ship designs. The new DNV GL rules for hull structures are supported by both the POSEIDON and Nauticus Hull software tools. These already have a strong reputation among designers and yards and have now undergone major updates to provide more efficient support for the design process and make it easier to apply the new rules. Please contact your local DNV GL software representative for details.

DNV GL Expert
Stian Erik Sollied (SS), Business Development Manager and Rules Expert
Phone: +47 911 52 712
E-Mail: stian.erik.sollied@dnvgl.com



The LNG-powered bulk carrier designed by Deltamarin will operate in the Baltic Sea.

DOUBLE DEBUT

The first DNV GL classification contract for an LNG-fuelled bulk carrier built to the new rule set has been signed – another milestone on the way to sustainable shipping.

The establishment of emission control areas (ECAs) in the Baltic Sea and the North Sea is driving technological advances towards low-emission shipping. In the Baltic Sea in particular, early initiatives to establish an LNG refuelling infrastructure have encouraged owners to embrace LNG as ship fuel. DNV GL recently signed the first classification contract for a large LNG-powered bulk carrier – and the first vessel ever to be built to the new DNV GL class rules.

The project comprises two sister vessels which have been developed by the Finnish ship design and engineering group Deltamarin for the Finnish owner ESL Shipping Ltd., the leading carrier of dry bulk cargoes in the Baltic Sea region. Both companies cooperated closely on the concept development to make sure the ships meet the demanding trading requirements of the Baltic area.

Mastering difficult climate conditions

Deltamarin is using its proven B.Delta26LNG design with a highly optimized hull form as a basis for these extremely energy-efficient ships, which will be built at Sinotrans & CSC Qingshan Shipyard in China. They will begin operating in the Baltic Sea in early 2018, supplying raw material to heavy industry and power generating companies. The 25,600 dwt handysize bulkers will feature highly efficient cargo handling and cargo hold arrangements, enabling rapid loading and unloading. To ensure reliable year-round operation in the difficult climate conditions of the Baltic Sea, they will receive the additional class notation DNV GL Ice Class IA.

Equipped with dual-fuel main and auxiliary machinery and 400 m^3 type C LNG tanks, these vessels will be able to bunker LNG at several terminals in the Baltic region and meet all current emission requirements. Their CO_2 emissions per cargo tonne transported will be reduced by over 50 per cent compared with present-generation vessels. The energy efficiency design index (EEDI) value will satisfy the International Maritime Organization (IMO) reference line requirements even in Phase 3 which will come into force in 2025.

The bulk carriers will be built to the new DNV GL rules for general dry cargo ships. "It is fitting that the first vessels that will be constructed to the most forward-looking set of classification rules are themselves at the cutting edge of maritime innovation," says Knut Ørbeck-Nilssen, CEO of DNV GL – Maritime. "We have created these rules to be ready for the future and we have long pioneered the use of LNG as a ship fuel. To see these two come together in a double first for the industry is a remarkable moment."

Ship designers have to account for increasingly complex requirements, resulting from stricter regulations and the need for optimal efficiency, which makes close cooperation with class more important than ever. Applying the new rule set for the first time was a journey into the unknown for the designers at Deltamarin. Konstantinos Fakiolas, Sales Director Ship Design at Deltamarin, reports: "The new rules are easier to handle than the old ones, and accessing them has become easier as well.

Mikki Koskinen, Managing Director of ESL Shipping: "Our main trade in the Baltic Sea is very busy and demanding, not only due to winter ice conditions but also because of tight schedules and very short port calls. That is why we need a classification partner capable of delivering services promptly and effectively when required without affecting the schedules of vessels. We chose

DNV GL because of our good experience from our last series of newbuilds and because we are convinced they have the required high level of knowledge of LNG systems and safety."

Optimized for varying sea conditions

Konstantinos Fakiolas describes how Deltamarin approaches the project: "We first modified the B.Delta26LNG design to make the ship fit for its trading purpose, then optimized it further to reach the highest possible levels of IMO compliance and ensure her competitiveness throughout her lifetime. The cargo spaces have been specifically designed and arranged jointly with the owner to meet the requirements in terms of cargo flexibility, distribution and quantity. The proven hydrodynamic properties of the Delta Series have been maintained despite the necessary restrictive Ice Class features, and optimized further in terms of power requirement, engine economy and hull lines. Finding the perfect solution for operation in two different weather conditions – icy water and open water – and different sea states has been challenging, but I believe we have found it."

A trendsetting design

For ESL, LNG was the preferred fuel option for the ships, says Mikki Koskinen: "In short-sea trades LNG is presently the best available large-scale energy solution, both operationally and from the environmental point of view. For us and our customers, LNG is a very good choice and will definitely be part of our future plans, despite the slow development of the LNG supply infrastructure, the large space requirement on board and the relatively high additional investment required."

Koskinen believes the new LNG powered bulkers are more than just state-of-the-art additions to ESL's fleet. "The ship concept developed jointly by the experts from Deltamarin and ESL Shipping is a trendsetting design that brings the commodity transport segment into a new era of greener shipping. When completed these vessels will be among the most environment-friendly ships to sail in pollution-sensitive areas, such as the Baltic." Fakiolas still sees additional optimization potential in ship design by expanding the range of parameters considered in the endeavour. "Future bulk carriers need to be operationally optimized further throughout their trade envelopes, accounting for various draughts and speeds while at the same time improving dynamically related performance characteristics, such as course-keeping at various sea states and wave angles, manoeuvrability in ports, and cost-efficient lifetime operation.

Sealing the deal: Knut Ørbeck-Nilssen, CEO of DNV GL – Maritime (left), with Mikki Koskinen, Managing Director of ESL Shipping Ltd.

The future ship must be designed 'fit-for-trades' instead of 'fit-for-cargoes'. Traditionally ship fuel consumption has been optimized for only a few fixed operational points, and the improvement potential for these conditions is usually limited. New design tools and methods set a completely new baseline to fuel efficiency evaluation that corresponds to real-life operation." Fakiolas is sure other ship types could benefit from the design improvements achieved with Deltamarin's B.Delta26LNG type.

ESL's Mikki Koskinen agrees that his company's new bulk carriers set the right course for ship design in general: "Shipping needs to be much more environmentally conscious and we must work hard in order to reduce our carbon footprint and other emissions. LNG helps us in achieving our ambitious goal of cutting our CO_2 emissions in half. We believe the industry will follow, since sustainability and profitability in our business go perfectly hand in hand." **AK**

Deltamarin's Sales Director Ship Design Konstantinos Fakiolas.

Photos: DNV GL, Deltamarin, ESL

DNV GL Expert
Morten Løvstad, Business Director Bulk Carriers
Phone: +47 975 63 009
E-Mail: morten.lovstad@dnvgl.com

WHAT YOU CAN EXPECT FROM A LEADING CLASS

Ship Type Experts at major hubs stand ready to assist DNV GL customers with their projects and keep them up to date on rules and regulations.

Listening carefully to customer feedback, DNV GL has identified a need for faster delivery of expert answers to customer enquiries. The result is a new service enabling customers to contact technical specialists directly, and the appointment of Ship Type Experts at all major hubs to deliver the world's best technical support.

With about 4,700 highly skilled employees active in the maritime segment, including a worldwide network of more than 2,000 competent surveyors, DNV GL is the leading class society not only in size but in safety, quality and service delivery as well. Still, size matters and, with a greater global reach than any other class, DNV GL is in a unique position to offer comprehensive services for its customers' vessels wherever and whenever they are needed. To further improve its responsiveness and accessibility to customers, DNV GL has implemented a 24/7 technical support service called DATE (Direct Access to Technical Experts), and appointed Ship Type Experts for all major ship types at all major shipping hubs around the world.

Around-the-clock access to technical experts

Among the most frequent customer responses to the question what DNV GL could do to deliver even more value was the need for timely, authoritative and insightful answers to technical questions. Over the last two years DNV GL therefore implemented its technical helpdesk DATE which provides owners and operators of DNV GL-classed vessels with free access to DNV GL's expertise anytime and anywhere. Five support hubs around the world as well as online access through the new DNV GL digital platform **my.dnvgl.com** ensure true 24/7 availability of the service. Technical queries are routed to one of the five support hubs and can draw upon the knowledge of 400 technical experts globally, all authorized to provide formal answers on behalf of DNV GL. Enquiries are normally answered within one working day, and urgent requests within a few hours. Examples of cases which may be resolved by the DATE service include certificate issues, postponements, survey requirements, evaluation of repair proposals, interpretation of class and statutory rules, and minor alterations.

Well over 100,000 support cases have already been handled by DATE. Every customer can review all questions and answers registered for it on **my.dnvgl.com**. The accumulated case records form a growing list of frequently asked questions (FAQ) on class-related matters. DNV GL intends to provide the world's best technical support on classification matters, and DATE leverages the scale and knowledge of DNV GL for the direct benefit of customers.

Unmatched bulk carrier expertise

With the world's most modern and practical classification rules released recently, and a huge base of cutting-edge expertise, DNV GL is a technology leader in the bulk carrier segment. Major safety-related studies and campaigns have been initiated in recent years, such as the Guideline on Cargo Liquefaction, and DNV GL has assisted designers and owners in the development of leading-edge designs featuring exceptional cargo flexibility and energy efficiency, such as the Green Dolphin 38 Handy, and more recently, the world's first LNG-fuelled bulk carrier B.Delta26LNG.

In the bigger, specialized vessel categories, more than 50 per cent of the very large ore carriers older than five years are DNV GL classed, and biggest of them all, the 400,000 dwt Valemax vessels, have all been designed to DNV GL rules. For the customer this translates to more practical experience and more surveyors with detailed knowledge of these highly specialized vessels available worldwide than with any other class.

To further strengthen its position in all bulk carrier segments, DNV GL has not only appointed a dedicated Bulk Carrier Director but also built a network of bulk carrier Ship Type Experts (STE) located in all major bulk carrier hubs worldwide. The STEs cooperate closely with the Bulk Carrier Director and the Approval Centres, offering a dedicated expert channel to designers, yards, owners and operators to discuss matters specific to bulk carriers – from design through to operational matters.

Each STE has a special responsibility to monitor technical developments within the bulk carrier segment, cooperating with other STEs and DNV GL technical experts around the world. They all share their knowledge through active contributions to seminars and conferences, technical meetings as well as lectures in bulk carrier training courses offered by the DNV GL Academy. >

The new DNV GL Cargo Liquefaction Guideline addresses risks concerning the moisture content of the ship's cargo.

Photo: bergamont - Fotolia, DNV GL

The customer portal "My DNV GL" offers access to personalized services from DNV GL – anywhere, anytime.

> To date, dedicated bulk carrier STEs have been appointed for the following regions: Greater China, Korea and Japan, the Nordic countries, Germany and Greece. While DNV GL surveyors with extensive bulk carrier expertise can be found worldwide, STEs at these major bulk carrier hubs provide even more in-depth knowledge. They are natural contact points for discussing new bulk carrier designs and technology.

STE for the Nordic countries

"Bulk Carrier Ship Type Expert is a title I am personally proud of," says Håvard Helling who has worked with bulk carriers since he joined the company in 2005. From being an approval engineer at DNV GL in Norway he moved to the Shanghai Approval Centre in 2009 and returned to Norway in 2012.

"One hot topic for me right now is cargo liquefaction," says Helling. "This is unfortunately a problem area which causes many accidents." Cargo liquefaction, the abrupt transformation of soil-like materials from a solid dry state to an almost fluid state, can happen in adverse weather conditions when the moisture content of the cargo is too high and the cargo begins to shift. If a bulk carrier starts to list until it takes water, it can be doomed with little or no time for the crew to abandon ship, and tragic crew loss becomes a reality. If the problem is detected early enough, the heading and speed can be adjusted to reduce movements and seek an emergency port. But the best approach is to avoid this situation altogether. The new DNV GL Cargo Liquefaction Guideline addresses this problem, raising awareness among owners and crews and helping ship masters verify and avoid taking on cargo that does not comply with the limits for moisture content.

> "We undertook an extensive verification of existing and new designs for the new DNV GL rules."
>
> **Håvard Helling**, DNV GL Bulk Carrier Ship Type Expert

Over the past few years Håvard Helling was heavily involved in the development and implementation of the new and updated Common Structural Rules (CSR) which came into effect in July 2015. In addition, he contributed to the new DNV GL class rules which were published in autumn 2015 and came into effect in January 2016, a milestone achievement and the result of a two-year concerted effort following the merger of DNV and GL. "We spent plenty of time with yards and designers to find good solutions for CSR-compliant bulk carrier designs," Helling reports. "For dry cargo vessels not covered by the CSR, such as ore carriers, open-hatch general cargo carriers and multipurpose dry cargo ships, we undertook an extensive verification of existing and new designs for the new DNV GL rules," says Helling.

Both the new DNV GL rules and the CSR are based on state-of-the-art scientific and engineering knowledge and the best available standards and methodologies. Just as important, however, is the fleet-in-service experience that has been incorporated.

From design through to operational matters, DNV GL offers unmatched ship type specific expertise to its bulk carrier customers.

Survey and damage reports from several years were reviewed to identify areas were the rules could be improved. Similarly, thickness measurement records were evaluated to make sure the corrosion additions were reasonable. "The goal is always to put the steel where it matters or, in other words, where it increases safety and makes sure the vessel is fit for purpose," Helling explains.

STE for Greater China

Senior Plan Approval Engineer Can Chun Cai has been in the industry for over ten years as a bulk carrier specialist. he was appointed Ship Type Expert for bulk carrier in Greater China in 2014. "My role as a bulk carrier STE is to support our customers proactively. T-shaped skill profiles with multidisciplinary knowledge and the ability to build good personal and professional networks internally and externally are essential for supporting our customers effectively," says Can Chun.

In addition to his job as a plan approval engineer, Can Chun attends to the numerous tasks of a bulk carrier Ship Type Expert for Greater China: he has to provide timely technical support to customers including shipowners, shipyards and design offices, inform stakeholders about the latest bulk carrier-related rules and regulations, performing specification reviews, and share information and knowledge with customers through bulk carrier workshops, forums, training courses and external conferences, among other responsibilities.

"At DNV GL there is always a network of experts you can rely on and work with," says Can Chun. "I collaborate closely with the global bulk carrier director, regional pre-contract managers, district business development managers and other local and global experts within DNV GL. We share experiences, knowledge, information and workloads across our global Ship Type Expert network. Even more importantly, we work on many joint projects (JDP/JIP) with customers, and invest a lot of effort in studying new technologies emerging across the industry. For example, I am convinced future bulk carrier designs will feature both glass-reinforced plastic (GRP) hatch covers and hybrid cranes to make them more competitive," he adds.

> "At DNV GL there is always a network of experts you can rely on and work with."
>
> **Can Chun Cai**, DNV GL Bulk Carrier Ship Type Expert

In 2015 Can Chun and his peers worked hard to improve the calculation tools to support designers and yards, incorporating both the new CSR rules and the new DNV GL rules. Efforts continue to make these tools even more efficient. In addition the group developed a two-day training course in finite element modelling and analysis for Chinese yards and designers, introducing best practices and showing participants how to use the DNV GL tools in the most effective way. "These workshops and training courses for rules and tools have been welcomed by owners, yards and designers with great appreciation," Can Chun stresses. ■ **ML**

DNV GL Experts
Håvard Helling,
Bulk Carrier Ship Type Expert
Phone: +47 938 44 057
E-Mail: havard.helling@dnvgl.com

Can Chun Cai,
Bulk Carrier Ship Type Expert
Phone: +86 21 3279 9160
E-Mail: canchun.cai@dnvgl.com

KEEPING PACE WITH ENVIRONMENTAL REGULATIONS

The environmental impact of the shipping industry remains a topic of keen interest for regulators, with agreed regulations entering into force in the near future and new regulations being developed around the world. Understanding the evolving regulatory landscape is of strategic significance when making business decisions.

Over the past decade, shipping has seen a surge of environmental regulations. Political pressure and an increasing focus from society at large have driven the International Maritime Organization (IMO), various countries and regions such as the EU to develop steadily more stringent regulations. The consequence is a patchwork regulatory system, where numerous overlaps create challenges for operators. There are unfortunately no indications that this will change. It is important for operators to both understand the existing regulatory framework and be aware of forthcoming developments, both at IMO and elsewhere, in order to make the right business decisions.

Ballast water management

Ballast water management has been a hot topic for a number of years. At present, the Ballast Water Management (BWM) Convention is only 0.21 per cent short of the gross tonnage ratification threshold. Several states have announced imminent ratification, and DNV GL believes the threshold is likely to be crossed sometime this year. The convention will then enter into force one year later, requiring all ships to comply within the following five years. The content and interpretation of the convention are still evolving. Presumably the IMO Marine Environment Protection Committee (MEPC) 70 will finalize the revision of the technical guidelines in October. There are presently 65 IMO-approved BWM systems on the market.

The national ballast water management regulations of the United States entered into force in 2013. New ships now have to comply upon delivery, while existing ships must comply by the first scheduled dry docking after 1 January 2014 or 2016, depending on ballast water capacity. US type approval is required for the ballast water treatment systems of affected ships; so far no such approvals have been granted. To address the obviously paradoxical situation of having to install approved systems when none have obtained type approval, the US Coast Guard (USCG) has issued more than 50 so-called Alternate Management System (AMS) approvals for systems accepted by IMO. These approvals are limited to a five-year validity period. To ease the transition further the US is also liberal in granting time-limited exemptions

Ballast water is among the top environmental issues addressed by new regulations.

Photo: Hasenpusch

to individual ships. We believe that once US-approved systems become available the extension policy will become significantly more stringent.

For more information on different ballast water topics such as treatment systems and approval process please visit **dnvgl.com/bwm**.

SO_X regulations

Discussions at IMO are centred on the question of whether the global 0.5 per cent sulphur content requirement should enter into force in 2020 or 2025. A fuel availability study is in progress to provide a discussion basis for an IMO decision which may be made at MEPC 70 in October 2016. A complicating factor in the discussions is the EU Sulphur Directive, which stipulates a maximum 0.5 per cent sulphur content for all EU waters by 2020, irrespective of the IMO decision. If different dates are decided by IMO and the EU, shipping will for a period face a three-tier sulphur content regime. From an operational perspective, this will be challenging.

It should also be noted that the Water Framework Directive is putting constraints on the discharge of scrubber water in certain EU countries. Belgium and Germany have in essence prohibited the discharge of scrubber water in most areas, severely constraining the operation of open-loop scrubbers. Other EU countries are following suit to a lesser or greater degree, with no common EU practice likely to be agreed. China has recently published regulations for SECA-like fuel requirements in certain coastal areas (see box next page).

More information and our updated Sulphur guideline are available at **dnvgl.com/lowsulphur**.

NO_X regulations

NO_X Tier III requirements have entered into force in the North American ECA for ships constructed on or after 1 January 2016. In essence, anyone constructing a ship today needs to consider potential operation of the vessel in the North American ECA, whether upon delivery or at some time in the future. If such an operation pattern is conceivable, NO_X control technology will >

> be needed for that ship. In contrast to the North American ECA the ECAs in the North Sea and the Baltic do not yet include a NO_X requirement. This has been on the table for a number of years and there are now robust signals that a joint North Sea/Baltic NECA application will be made to MEPC 70. Assuming agreement at IMO these Tier III requirements are expected to apply to ships constructed on or after 1 January 2021.

CO_2 and energy efficiency

Climate change remains the driving political force behind CO_2 and energy efficiency regulations. In the EU, regulations for Monitoring, Reporting and Verification (MRV) of CO_2 emissions have entered into force, requiring all ships above 5,000 GT sailing to or from European ports to comply. Ships must also report cargo data and average energy efficiency. The EU will make the data publicly available on an annual basis. Monitoring plans are to be submitted to verifiers by 31 August 2017, with 2018 being the first year of reporting. Data will be published by the EU in mid-2019. There is extensive work in progress to develop the practical framework and the EU is expected to publish practical details towards the end of 2016.

Part of the purpose behind the EU MRV regulations is to encourage IMO to work on a similar mechanism with global, not only regional, coverage. The EU has stated that if this happens it will mothball its regulation. It is therefore of great significance that MEPC 69 did agree on a global mechanism for mandatory monitoring, reporting and verification of fuel consumption data for all ships above 5,000 GT. The scheme is expected to be adopted at MEPC 70, in which case 2019 will likely be the first year of operation. However, the scheme differs from the EU MRV in several important aspects, including confidentiality of data, calculation of efficiency metrics and requirements regarding the verification of data. While the European Commission sees the IMO work as an important step forward it seems unlikely to view the mechanism as robust enough to reverse its own course on the MRV scheme. DNV GL expects that the shipping sector will have to deal with two different but overlapping reporting regimes for at least some years.

IMO is also seeing a reinvigorated discussion on long-term CO_2 emission goals following the global climate change agreement reached in Paris last year. There is as yet no agreement within IMO regarding the need to move beyond establishing a fuel data collection system, and it remains to be seen whether consensus can be reached. DNV GL sees a very real risk that unless significant progress is quickly made at IMO, other bodies outside the shipping industry may attempt to issue regulations. This would not be of benefit to anyone, least of all the shipping sector itself. ■ EN

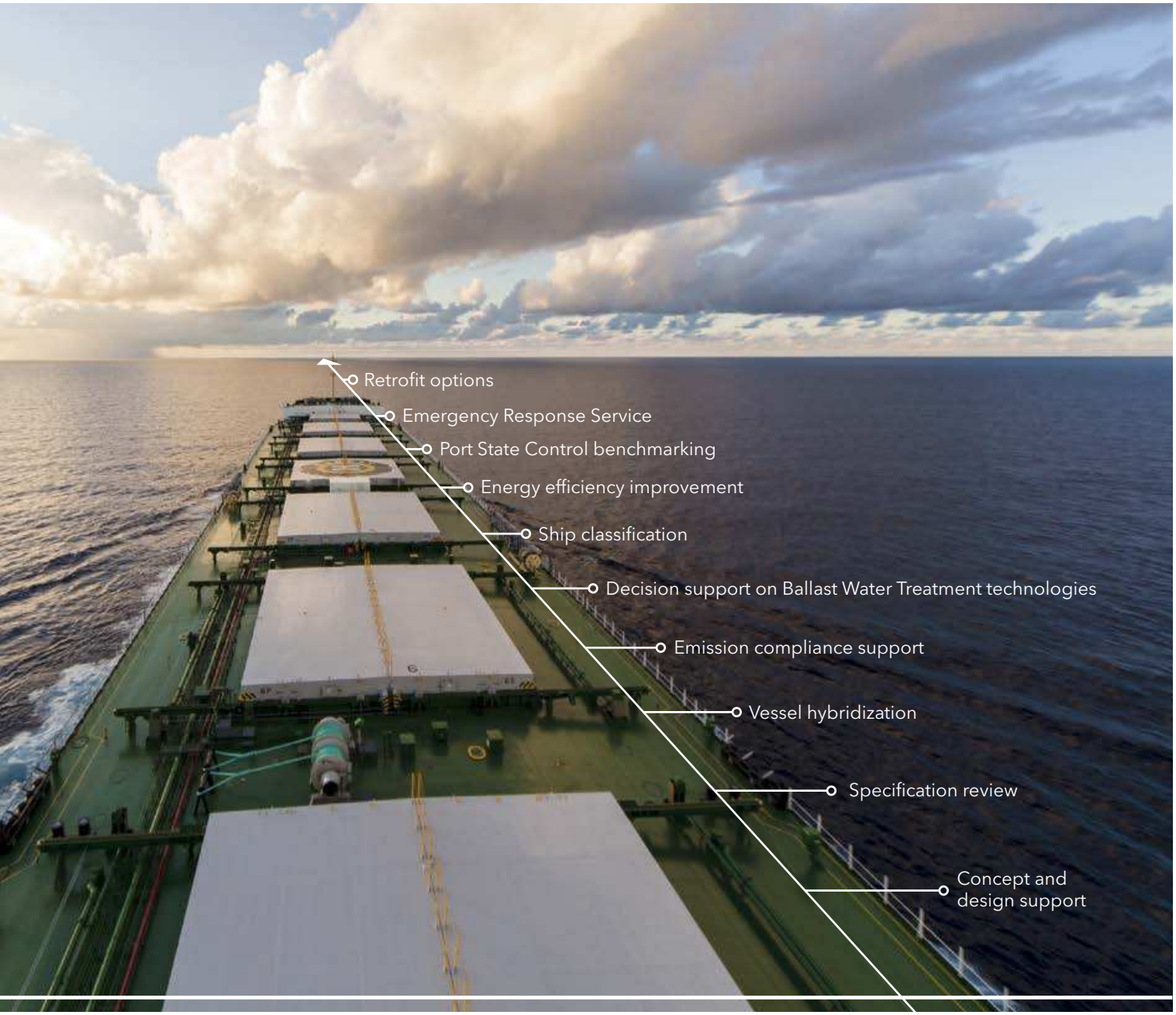
All technical and regulatory news can be found at **dnvgl.com/tecreg**.

DNV GL Expert
Eirik Nyhus (EN), Director Environment
Phone: +47 926 23 818
E-Mail: eirik.nyhus@dnvgl.com

CHINA IMPOSES SULPHUR LIMITS AND MIGHT ESTABLISH SECA ZONES

China has published regulations to establish SECA-like sea areas outside Hong Kong/Guangzhou (Pearl River Delta) and Shanghai and in the Bohai Sea. In a staged approach, the new regulations impose an initial 0.5 per cent sulphur limit for fuel burnt in key ports within these areas, gradually expanding the coverage to finally encompass these sea areas entirely from 2019 onwards. The sulphur limit might be lowered to 0.1 per cent as of 2020, and a formal ECA application may be submitted to IMO.

Photos: DNV GL, oradio.com, Fotolia



WHAT YOUR BULKER NEEDS – ANYTIME, ANYWHERE

To support you in remaining competitive, DNV GL offers every service for your bulk carrier, where and when you need them. With the most extensive coverage of any classification society, we are accessible worldwide 24/7. Use our new customer portal My DNVGL, or our DATE service (Direct Access to Technical Experts) to get real solutions directly from our technical experts within 24 hours. The accumulated experience of more than 2,500 surveyors and data analytics from more than 13,000 ships in class, combined with continuous investment in research and new services, means you'll benefit from cutting-edge quality that you can count on – anytime, anywhere.

Learn more at **dnvgl.com/maritime**

SAFER, SMARTER, GREENER

Regional Maritime offices

Americas
1400 Ravello Dr.
Katy, TX 77494
USA
Phone: +1 2813961000
houston.maritime@dnvgl.com

Greater China
1591 Hong Qiao Road
House No. 9
200336 Shanghai, China
Phone: +86 21 3208 4518
marketing.rgc@dnvgl.com

North Europe
Johan Berentsens vei 109-111
Postbox 7400
5020 Bergen, Norway
Phone: +47 55943600
bergen.maritime@dnvgl.com

South East Europe & Middle East
5, Aitolikou Street
18545 Piraeus, Greece
Phone: +30 210 41 00 200
piraeus@dnvgl.com

Germany
Brooktorkai 18
20457 Hamburg, Germany
Phone: +49 40 36149-8786
region-germany.maritime
@dnvgl.com

Korea & Japan
18F Kyobo Bldg.
Jong-ro 1, Jongno-gu
110714 Seoul, South Korea
Phone: +82 2 734 7326/7
region.korea@dnvgl.com

South East Asia & India
16 Science Park Drive
118227 Singapore
Singapore
Phone: +65 65 0 837 50
sng.fis@dnvgl.com

West Europe & Africa
3 Cathedral Street
Palace House
London, SE1 9DE
United Kingdom
Phone: +44 207 357 6080
london.maritime@dnvgl.com

DNV GL AS
NO-1322 Høvik, Norway
Tel: +47 67 57 99 00
www.dnvgl.com

DNV GL – Maritime
Brooktorkai 18
20457 Hamburg, Germany
Tel: +49 40 36149-0
www.dnvgl.com/maritime

DNV GL
Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil & gas and energy industries. We also provide certification services to customers across a wide range of industries.

Combining leading technical and operational expertise, risk methodology and in-depth industry knowledge, we empower our customers' decisions and actions with trust and confidence. We continuously invest in research and collaborative innovation to provide customers and society with operational and technological foresight. With origins stretching back to 1864, DNV GL's reach today is global. Operating in more than 100 countries, our professionals are dedicated to helping customers make the world safer, smarter and greener.