

# *Joining forces for our maritime future*

The Norwegian Maritime Authority (NMA) has strengthened its accessibility and service, and is now working with the industry to reinforce Norway's maritime sector for the future. One result is the symbolic naming of *Viking Star* as the first cruise ship under the national flag for a decade on 17 May – Constitution Day. This registration reflects a new vigour in Norway's maritime administration.

# Dear reader

Norway is an attractive flag state, and marketing Norwegian registration represents an important job for us at the NMA along with our focus on enhancing safety at sea. The number of ships under the Norwegian flag has declined in recent years, which in turn affects Norway's influence in international fora such as the UN's International Maritime Organisation (IMO). We want to reverse this trend.

Olav Akselsen, director-general of shipping and navigation and head of the NMA, has improved our service culture and ensured that greater attention is paid to contact with customers. Results include a digitisation of our services and speeding up administrative processes. A growing number of people report that we are now perceived as an organisation which gives high priority to service. That is gratifying, and a great inspiration in our day-to-day work.

Marketing Norway as an attractive flag state is also the reason we have now published this supplement. Our committed and able personnel contribute in their different ways to ensuring continued progress both for us and for the industry, and we have sought to highlight that in these pages. We would have liked to present all the interesting and important jobs we do, but space prevents that. Nevertheless, we hope these pages convey something of our breadth.

And if a vacancy should arise in our ranks, I can affirm that we have a good and pleasant working environment with many highly interesting assignments. Enjoy this publication.

DAG INGE AARHUS  
Communication director, NMA



PHOTO: NMA



PHOTO: JOHAN ALP

## Trade and industry minister Monica Mæland Uniting for Norway's maritime future

The NMA's job is to secure good solutions for the industry, for shipping companies and for seafarers. That will strengthen our maritime sector for tomorrow.

We have long and proud seafaring traditions. More than 100 000 people work in Norwegian maritime companies, and this sector has an annual turnover of NOK 174 billion. To remain a leading maritime nation, we must ensure that the industry is competitive and adaptable.

An important job is done for our maritime sector by the NMA. It helps to see that safety, environmental protection and vessel registration are dealt with in a positive and satisfactory manner. This has been incorporated in the government's maritime strategy, where administration and simplification form one of eight key topics.

With owners able to enter their vessels in other national registers, the NMA faces competition. This means it must adapt to the industry's needs and seek good solutions to-

gether with companies and seafarers.

Digitisation is important for simplification in the maritime sector, and will help to strengthen the competitiveness of the Norwegian International Ship Register (NIS).

I would also highlight the NMA's regulatory project, which aims at simpler and more user-friendly regulations for seafarers, shipping companies and others in the industry. Customer expectations are rising. So it is positive that the NMA has stepped up its work on accessibility and service. This is important for marketing us as an attractive flag state.

Competitive ship registers help to keep activity and head offices here. A big Norwegian fleet provides a stronger presence on the world stage. Through international organisations, we can ensure that new global conventions are put in place more quickly.

In that way, we can help to raise safety and environmental standards.

The government is working to ensure that our maritime sector will be as well equipped as possible to tackle challenges and seize new opportunities. I look forward to taking important steps for this important industry – together with the NMA.



PHOTO: HANS JØRGEN BIRN

**FORWARD-LOOKING:** As trade and industry minister, Monica Mæland is responsible for shaping forward-looking policies.

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As a turnkey supplier, Westcon in practice organises everything from A to Z once it is awarded an assignment. Broad expertise and all disciplines under a single umbrella mean processes move faster and more smoothly, and provide scope for continuous collaboration with customers for even more cost-efficient delivery.

The highly dedicated workforce has technical insights and strengths which have supported success over several decades. Its 900 members – including 150 engineers – are ready to tackle customer jobs of any size. Project managers utilise Westcon's own project management tools, based on deep knowledge and long experience, ensuring safe and effective execution.

### Optimum resource use

More than 100 rigs and ships arrive at Westcon's yards every year for necessary repairs or planned maintenance, modification or conversion. The group's own personnel cover all key areas throughout, from lifting technology and electrical/automation systems to all traditional fabrication disciplines. Combined with a big in-house engineering staff, this ensures optimum resource use at every stage.

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is being installed at Ølen. That will cut the time required to bend pipes to a fraction of the current figure.

Maintenance, reclassification/inspection and modification are performed while the relevant rig or ship remains operational. That cuts downtime and costs for the customer. To ensure safety offshore, this work is led by Westcon's own people.

### Innovative solutions

Westcon is committed to a high level of expertise and seeks to develop innovative solutions for complex issues. One example is the Westcon Laser Portal (WLP) software developed in-house to integrate measurement data in a new and user-friendly way.

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To learn more about Westcon Laser Portal, see the film at [www.westconyard.no/3D](http://www.westconyard.no/3D).



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*Jubilation reigned and the champagne flowed – the day had finally come. The first new cruise ship to fly the Norwegian flag for 10 years was named in Bergen on no less a day than 17 May.*

*This story continues from page 6.*





# Witnessing Norwegian shipping history in festive dress

The celebrations which attracted some 20 000 people to Bergen's historic Bryggen waterfront on 17 May are described as a great experience by NMA director general Olav Akselsen.

Shipowner Torstein Hagen wanted to put on a show in his home town when *Viking Star* was named, and promised a public celebration on Constitution Day. Before the actual naming ceremony, which took place in the late evening, Viking Cruises invited Bergen residents to a star-spangled free concert. The whole event culminated in a spectacular firework display. Hagen and the representatives of Norway's maritime authorities were perhaps equally proud.

"Walking along the Vågen harbour and seeing the big ship with 'Bergen' on its stern

was a special experience," says Akselsen. "It gave Constitution Day an added sparkle."

"The Norwegian flag is a stamp of quality," says Hagen. "I'm a bit of a patriot, and it feels good to sail under the national flag." *Viking Star* will be joined by sister ships *Viking Sea* and *Viking Sky*, both with the Norwegian flag at their stern.

## Proud of the choice

But it was no matter of course that these vessels would join the Norwegian International Ship Register (NIS). A decade has passed since Norway's last cruise vessel flagged out, and the decision to sign up on this occasion reflected close collaboration between Akselsen and Hagen.

"I wanted to discover what would make it possible to sail under the national flag," reports Hagen. "Some conditions had to be clarified. The dialogue has been very good, and the NMA's staff have been exceptionally accommodating."

"I'm proud that the shipowner has chosen the NIS, and hope it will send a strong signal

to other shipping companies to follow suit," adds Akselsen. "We've worked purposefully for a long time to make Norway the preferred maritime administration, which has led to many changes in the NMA."

Trade and industry minister Monica Mæland is also very pleased: "I'm glad we're getting cruise ships registered in Norway again. Vessels under the national flag are important for retaining and developing our position as a maritime nation. The government is working to strengthen its maritime administration, and to increase the number of ships registered here. The NMA's commitment to outreach and concentration on customers will help it to be preferred by the companies."

## Price is peanuts

*Viking Star* can accommodate 930 passengers in cabins ranging in size from 25 to 135 square metres, all with balconies. Companies have competed for a time over building giant cruise ships as floating hotels, but Hagen would sooner have a floating home.

"We believe that such a vessel offers more personality and a better overall experience. People are dwarfed on these huge ships. We put different values first."

He sees no reason why other companies should not register cruise ships under the Norwegian flag. "The price is a bit higher than other registers, but it's only peanuts in this context."

"I've always liked going against the flow a bit. The Norwegian flag is also something we can use in our marketing strategy. We think passengers will appreciate our priorities."

*Viking Star* features restaurants, bars, shops, spa and fitness centre, winter garden and sports deck. Its dimensions allow it to call at most ports and to berth in city centres. The ship will cruise fjords from western Norway to the Baltic, as well as southwards and into the Mediterranean.

Founded in 1997, Viking Cruises has been the world's leading provider of river voyages. Its trips along waterways in Europe, Russia, Egypt, China and south-east Asia are very popular.



**CELEBRATED:** The 220-metre-long Viking Star provided a spectacular backdrop for the free festival in Bergen's Vågen harbour. NMA head Olav Akselsen (top left, centre) was one of the many who watched the star-spangled concert, which included a performance (above) by Norwegian singer Sissel Kyrkjebø and world-renowned violinist Charlie Siem.

PHOTOS: JOHAN ALP



**PROUD:** Shipowner Torstein Hagen believes passengers appreciate a ship registered in Norway.

PHOTO: JOHAN ALP

## Why we choose the Norwegian flag



### Camilla Grieg, Grieg Group

"Supporting Norway's maritime community is incredibly important for us. We have great faith in the expertise which has been built up over generations.

"We're experiencing extremely tough international competition – the market is terrible. We've got to make our expectations of deliveries and costs clear. We're pleased that operating parameters allow us to fly a Norwegian flag at the stern. But the NIS also has a potential for improvement. While the NMA is able, we want an even stronger commitment on efficiency and terms. We experience a good and constructive dialogue, and want to remain Norwegian. We talk warmly about our flag in every context. It's not enough simply to say we have one of the world's largest fleets – there needs to be weight behind the Norwegian flag. We'll work collectively to improve. At the moment, the market is tougher than ever."



### Ingar Skiaker, Höegh Autoliners

"It's important for us that the ships in our fleet sail under quality flags, and we see several advantages with having vessels in the NIS – not least where the tonnage tax rules are concerned. The NIS is predictable and relatively unbureaucratic, which simplifies the execution of our projects when ships or mortgages are to be registered. Sailing the seven seas under the national flag also evokes much pride and many historical associations. Maintaining a Norwegian maritime tradition feels both right and important. The NIS provides excellent service when we need it.

"But some improvements are possible. In our experience, the actual logistics of issuing certificates is sometimes very long-winded. The NMA can learn here from processes in other flag states, and we hope this will improve in the future."



### Tore Jakobsen, Odfjell

"We have 27 vessels in the NIS. One important reason why we've been registering ships in Norway during recent years is that operating parameters for Norwegian shipping have become better and more predictable. As long as these parameters remain stable and are not affected by possible changes of government, we'll continued to have ships registered in Norway."

## Safety at Sea conference 2015

24-25  
September



Open day  
23 September

### Safety in focus

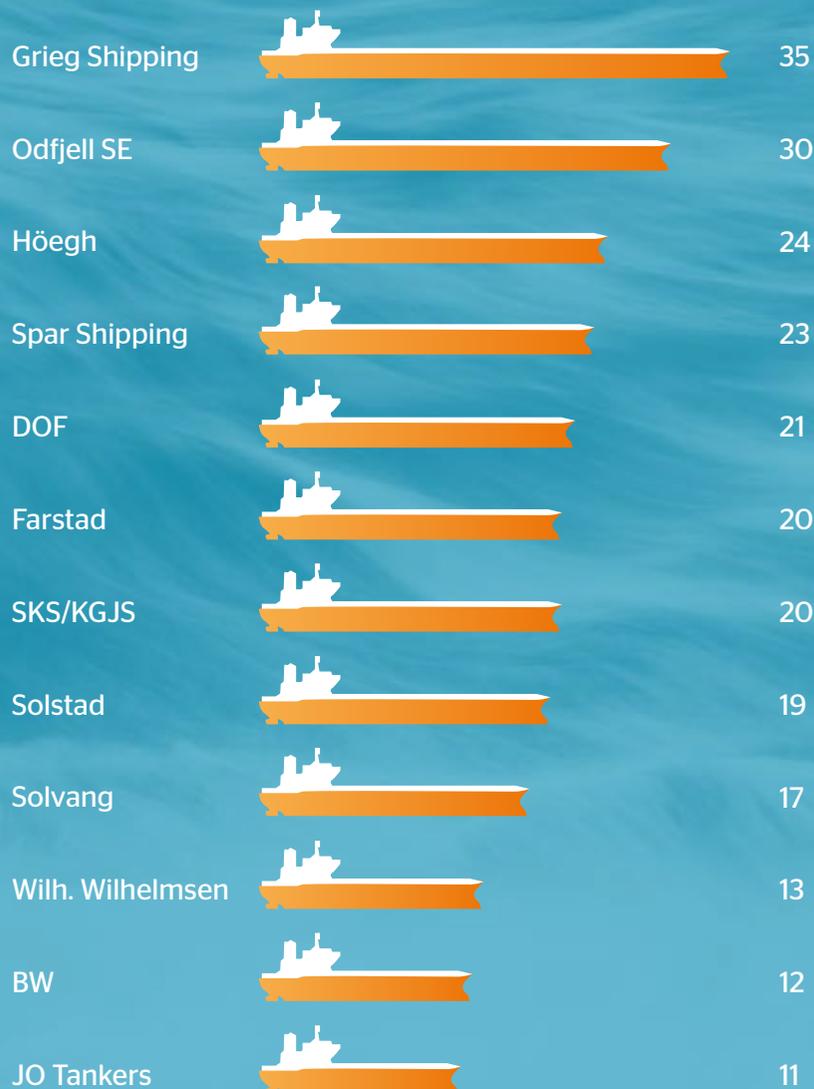
The annual Safety at Sea conference will take place in Hauge-sund on 24-25 September. Conducted primarily in Norwegian, the programme covers various safety issues for the maritime industry. The NMA again plans to stage its popular open day ahead of this event. A link to the Norwegian text about the conference is provided on the NMA website, and anyone interested can enter their e-mail address without obligation to stay updated on the programme and the registration process. The conference will take place in a maritime environment at the Scandic Maritim Hotel.

This entire supplement is an advertisement from the NMA



PHOTO: ODFJELL

The 12 largest companies in the Norwegian International Ship Register (NIS). The length of a vessel bar is proportionate to the number of ships registered.



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# NIS-registered ships



“White list” identifies the best shipping nations

# Up in the top rank

Norway has climbed to second place in the exclusive set of nations with the best ship registers. France comes first.

Europe’s coastal states along with Russia and Canada collaborate under the Paris memorandum of understanding (MoU) on this listing system, with white for the quality flags, grey for the average performers and black for the worst.

Staying high up the white list is very important for Norway as a flag state, says Alf Tore Sørheim, section head for inspection and emergency preparedness at the NMA. The country occupied 15th place not many years ago. Sørheim gives the credit for this progress to the industry, the reputable classification societies and the work done by the NMA.

“We took some steps to help pull Norway up the ladder. That included providing good information to the shipping companies and classification societies. We’re trying to detect companies or vessels with unfortunate records before they end up being detained abroad. These players are being closely monitored, with inspection and guidance used to reverse negative trends. The com-

panies have taken this seriously, and have mostly been good at changing course where necessary. Norway wouldn’t have been able to climb up the list without good collaboration between industry and government.”

A white-list flag is required for a ship to be designated as low-risk. That represents a stamp of quality and means the vessel will be inspected less frequently. Ships on the grey or black lists could be subject to more frequent checks.

Statistics show that Norwegian-flag vessels were inspected about 1 500 times over three years, resulting in 16 detentions.

## Serious business

Detention is a serious business for a shipping company, primarily in terms of idle time and lost revenues. The ship also gets a negative stamp. Customers have access to information on this, and may quickly choose another company if a ship has too many problems.

Asked what it takes for a ship to be de-



**QUALITY-CONSCIOUS:** Alf Tore Sørheim at the NMA. PHOTO: STEINAR HAUGBERG

tained, Sørheim says the general rule is that a threat must exist to life, health, the environment or material assets. “But there’s no cut-and-dried answer. The inspector must

use their own judgement in every case.”

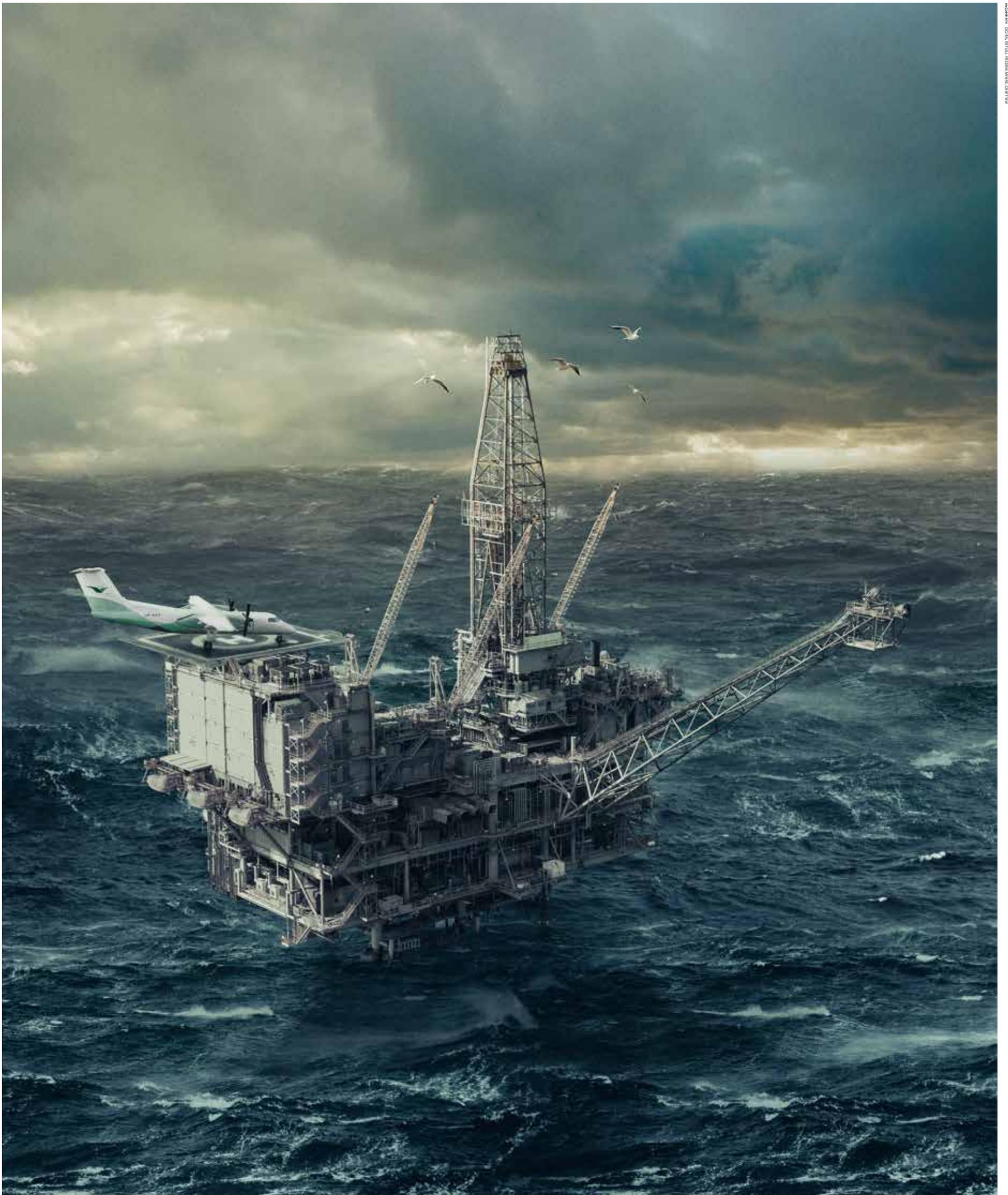
Companies can appeal against a detention they feel is unreasonable. The first step is to complain to the port state, but should this fail to resolve the issue an appeal system is provided by the Paris MoU. Involving the flag state will be important here.

“We’re ready to help a company if we believe the detention is groundless,” says Sørheim. “We have a number of examples of such reactions being reversed after we’ve complained on behalf of the owner.”

Over time, the Paris MoU collaboration has worked to harmonise port state checks, with common training, a joint database and standard inspection procedures introduced. Norway has been a driving force in this work.

International competition to secure the status of being on the best lists is tough. Norway is also registered on the quality lists for the Tokyo MoU and the US Coast Guard.

“This shows that we’re a quality flag worldwide,” affirms Sørheim. “The most important consideration now is for the companies to maintain the good course we see they’re following. We’ll do what we can to ensure continued quality.”



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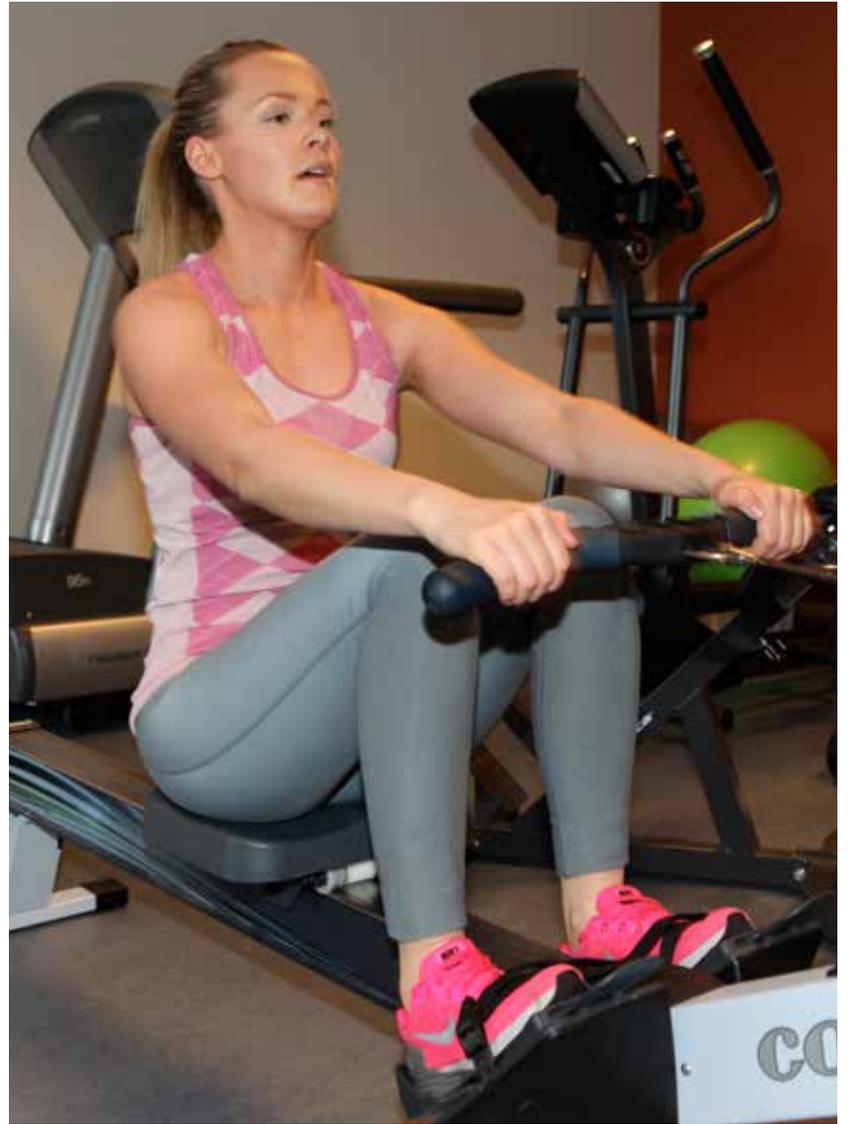
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Absorbing place to work

# From offshore ship to land-based job

NMA personnel work on local, national and global assignments. This wide range gives staff members good opportunities to apply their expertise and learn more.



**ACTIVE:** Heidi Therese Bless is pleased with the range of activities offered by the NMA, and uses the gym before starting work. She worked as first officer on an offshore ship before joining the authority. PHOTO: PER LARS TONSTAD

The NMA has a highly qualified and stable workforce today, with specialists recruited from many European countries. Collectively, they form a team well equipped to tackle current and future jobs.

“I didn’t actually think I’d thrive in a nine-to-five post on land,” says Heidi Therese Bless from Karmøy near Haugesund. “But it’s surprisingly OK. I haven’t had a single regret.”

A qualified first officer, she was in clover on Eidesvik Offshore’s pioneering *Viking Lady* offshore support vessel. Unique in the world, since it can run on liquefied natural gas (LNG) and batteries charged from a fuel cell, this ship served a drilling rig in the Barents Sea. Bless enjoyed her time there, working four weeks on and four weeks off.

### Full of praise

“Being in the immensity of the far north was a great experience,” she says. “But then came signals of a slowdown in the oil sector, and the job no longer felt so secure. So I applied to the NMA.”

She works now in the department for education, certification and crew, and is full of praise for her workplace.

“The atmosphere is very positive, and I have great colleagues who’re very capable. A good working environment is important for motivation. Every day is absorbing, and I feel I’m growing with the work. It’s rewarding to meet the industry, I’ve expanded my network and have also made new friends through the job.”

Bless is an active person, and appreciates the many activities offered by the

NMA. She use the gym almost every morning. Employees can participate in various sports – climbing is an attractive option, and people are often invited to cultural events or on trips.

### Busy in the north

Employees frequently travel to different parts of Norway or to conferences and meetings around the world. Since the NMA must be represented where the industry is present, it has a network of regional and inspection offices.

Principal surveyor Hans Trygstad Johansen and his colleagues in Tromsø are kept busy – one day perhaps with a ship in Kirkenes to be inspected, the next with an accident on a vessel off Troms county. Staff must be prepared to drop

what they are doing and head into the field at short notice.

“That makes this job more interesting and varied,” says Johansen. “The work is meaningful and important – we’re protecting the safety of those at sea.”

Born and bred in the northern port of Hammerfest, he knows what natural forces can do. So it is important to be prepared and to comply with legislation on maritime traffic.

The inspection office in Tromsø is subject to the regional office at Svolvær in the Lofoten islands.



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**NORWEGIAN TECHNOLOGY:** Mastrafjord berths in Mortavika as the other LNG-fuelled ferry departs. .

PHOTO: STEINAR HAUGBERG

# Accounts for almost 80 per cent of global fleet Leading the way with gas-fuelled ships

Gas producer Norway has the world's largest number of vessels running on this fuel. It has developed the technology, and is at the wheel as international regulations for building and operating ships powered by liquid natural gas (LNG) are put in place.

"Natural gas is an environment-friendly fuel with much lower emissions than diesel oil," says NMA technical director Lasse Karlsen. "And reserves are huge – the merchant fleet can expect secure supplies for centuries. We now expect an international breakthrough for LNG-fuelled vessels."

Through his window, he can watch the gas-driven ferry from Denmark gliding silently past to berth in Haugesund. Forty-six Norwegian ships out of a global total of 54 currently run on LNG. Low oil prices may have delayed a breakthrough for such vessels – they cost 15-20 per cent more to build than diesel-driven ships. Some countries have also held back while awaiting the regulatory system due to be adopted by the International Maritime Organisation (IMO) this summer. Norway is behind the proposed rules for vessels and crew competence.

## Invisible and odourless

Gas is an ancient fuel, first used by the Chinese 2 000 years ago. Technology to liquefy it was developed as far back as 1807. Norway's Storting (parliament) approved the construction of four gas-fuelled ferries in 1996.

"Many challenges were faced, no regulations existed," says Karlsen. "Adopting an invisible and odourless energy bearer represented a radical step. LNG vaporises at -198°C, compared with about 60°C for normal marine diesel. Preventing leaks and ignition was a key challenge."

One early idea was to add an odorant to the gas, but this won little support internationally. Vaporisation from the cargo would also make it impossible to work on a big LNG carrier if the gas smelt. So adequate systems to protect health and safety had to be developed. LNG operation needed to lie within the parameters which apply for all shipping.

"Detailed and important pioneering work was done here," explains Karlsen. "Engine manufacturers were good collaborators. All piping systems have been duplicated, form completely closed circuits and are made in high-quality materials. Intermediate spaces are ventilated and monitored by gas detectors to ensure that a leak can be spotted before it creates problems."

## Safety first

Fuelling with gas presented special challenges. Experience has shown that acci-

dents with this fuel primarily occur when systems are opened, and when cold liquid is piped from transport tankers to fuel tanks. Guidelines for such operations were drawn up by the Norwegian government, and the regulations are so secure today that bunkering can take place with passengers on board. Norway has contributed to current work on a standard coupling for such fuelling.

All LNG-driven ships must have an approved safety management system. This provides a detailed assessment of all operations related to safety – regardless of weather, crossing or occasional traffic, quayside conditions and so forth. These certificates must be audited regularly. Passenger ships running on conventional fuel only need a safety management system if they can carry more than 100 people.

## No particulates

Karlsen notes the environmental benefit as the biggest advantage of gas-fuelled ships. The threat to the climate is driving ever-stricter rules on emissions at sea and on land.

"Vessels running on gas release no particulates, which are otherwise a growing problem with diesel oil," he says. "Emissions of nitrogen oxide and carbon dioxide are down by 90 and 38 per cent respectively."

International interest in adopting LNG as a fuel is great. A Japanese shipping company is building a gas-driven car carrier which will sail under the Norwegian flag. Big car ferries are gas-fuelled in Denmark



**ENVIRONMENT-FRIENDLY:** Technical director Lasse Karlsen is proud that the NMA has been a key partner in putting international rules on LNG-fuelled ships in place. "Natural gas reserves are huge, and its energy is much more environment-friendly with lower emissions than diesel oil."

PHOTO: BJARTE AMBLE

and Sweden. Karlsen reports that 11 delegations from major shipping nations have visited the NMA to take a closer look at LNG operation, and it has in turn presented the technology in Germany, China, Singapore and Hong Kong. He finds that many people are interested in Norway's experience.

"The key questions are cost and LNG availability in the world's main seas. Singapore has put everything in place, and the other big Far Eastern ports are following suit. The EU has ambitious plans for environment-friendly energy bearers. LNG is a green fuel which will be increasingly adopted by the world fleet."

Karlsen is proud that the NMA has contributed to forward-looking innovation. "When somebody comes to us with good ideas, we'll listen and look at the opportunities. We're happy to collaborate, and see that this pioneering spirit has yielded good results."

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Transportation and introduction of invasive organic material into new marine environments can have devastating effects, wiping out fishing industry and spreading diseases. OceanSaver is playing an important role in the development of ballast water treatment technology preventing this to happen by supplying the market with class and IMO approved systems, in addition to being a frontrunner in achieving USCG type approval.

**O**ceanSaver is a leading global provider of class-approved, high capacity and technologically advanced ballast water treatment systems (BWTS). The system offers a reliable and streamlined solution for both retrofit and new building projects. It delivers high-performance filtration in combination with disinfection through patented electro dialysis, flexible system installation, operation without restrictions as well as complete compliance with the regulations proposed by the International Maritime Organization (IMO) and the US Coast Guard (USCG) requirements to be in force as of January 1st 2016.

Established in 2003, OceanSaver was one of the world's first companies dedicated exclusively to the provision of patented and approved BWT solutions. The company is headquartered in Drammen, Norway, with local offices in Busan, Korea and Shanghai, China. The staff is local and with strong marine background in order to provide the full specter of assistance to ship owners and yards, from technical support and engineering to project delivery, service and commissioning.

#### Established market leader

Today, OceanSaver is an established market leader in the industry, and a significant player in

the development of BWT technology facing the final ratification of the IMO's Ballast Water Management Convention.

OceanSaver has delivered major contracts in all of its core market segments; medium to large-sized vessels within the Crude Oil Tankers, tankers with submerged ballast pumps, bulk Carriers and LNG/LPG vessels, delivering perfection to the retrofit and new building markets. As of March 2015 the company had a reference list totaling 150+ BWTS to ship owners and yards worldwide.

#### Retrofit – the complete package

Preparing for the IMO ratification and retrofit market to come, Mrs Helle Hundseid, CEO of OceanSaver as of January 2015, states; - OceanSaver un-

derstand retrofit. We have unparalleled hands on experience from previously performed retrofits and competence in design, engineering and project execution, including interface management. We can provide the complete package, from initial concept studies to system commissioning including handover to owner, within the timeframes required for project build-up and dry-docking.

Currently OceanSaver is building the already experienced organization to meet the demands and expectations of the coming retrofit market.

- By choosing OceanSaver you are guaranteed an easy-to-operate, energy optimized and safe BWTS that is capable of operating in all water conditions worldwide, at the highest technical standards, says Hundseid.

Whilst the technology is central to OceanSaver, its customers and vessels with installed systems are supported by an experienced and knowledgeable 24/7 global service network, including spare parts handling through the Norwegian based HQ as well as third party agents.

OceanSaver is living its vision: creating today - leading tomorrow.

**“Ballast water pollution is one of the four greatest threats to the world’s oceans”**

- International Maritime Organization (IMO)

#### OceanSaver as leader in the BWT Technology development

OceanSaver is working toward a common understanding within the maritime industry of having BWT systems compliant with all regulatory and environmental requirements. With USCG testing currently underway, OceanSaver is one of the defined frontrunners in achieving final type approval, aiming for certificate in hand early next year.

For further information, please contact Alan Linderoth  
ali@oceansaver.com  
Vice President Sales & Marketing



The C2E disinfectant unit, OceanSaver's core technology - skid mounted for ease of installation

Learn more about OceanSaver and its Ballast Water Treatment System at [www.oceansaver.com](http://www.oceansaver.com)





**ELECTRIC SHIP:** Ampere, the world's only all-electric ferry, on its way across the fjord.

PHOTO: NORLED

# Running on stored power

The world's only battery-driven ferry operates between Lavik and Oppedal on the E39 highway in Norway's western Sogn og Fjordane county.

The NMA had to break new ground in approving operation of the very first ferry to run on stored electricity. Its most important concern was that travelling by this vessel should be as safe as on conventionally powered ships.

Shipbuilder Fjellstrand in Hardanger and the Norled shipping company took the initiative to build the pioneering emission-free ferry. It needed a light hull and good propellers, had to glide easily through the water, and was constructed in aluminium rather than steel.

"Fire safety was our biggest concern," recalls Øyvind Skog, who worked with Elisabeth Førland on the project at the NMA.

No building regulations existed for such vessels. The NMA collaborated

with the Norwegian Defence Research Establishment, among others, and the project helped to build expertise for several participants.

"Fire safety in the battery compartment was assured by adopting a water mist solution," explains Førland. "Tiny droplets dance in the air and expand 1 700-fold when encountering flames. The oxygen is displaced, effectively quenching the fire."

Ideally, the NMA would have preferred more test results and documentation. This field is developing, and increased knowledge may lead to different requirements for battery-powered vessels in future. Batteries will probably be most relevant for top-up energy on hybrid vessels.



**DEVELOPMENT:** Elisabeth Førland and Øyvind Skog have helped to develop regulations for operating the world's only battery-powered ferry.

PHOTO: PER LARS TONSTAD

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**POSITIVE:** The NMA adopts a positive approach when people turn up with good ideas, and seeks good solutions which allow the project to go ahead, say Øyvind Vormedal (left), Raymond Lone and Kolbjørn Berge. They worked on approving four methanol-fuelled tankers.

PHOTO: PER LARS TONSTAD

# Introducing a new fuel for tankers

The world's first four ships to be driven by methanol are due to become operational in 2016. These tankers of roughly 50 000 tonnes are being built by two companies, one Norwegian and the other Swedish.

Although this chemical meets the ever more stringent demands posed for energy sources, its availability on the global market is restricted.

The NMA has collaborated with the developers to get the projects approved within the general regulatory regime.

"Methanol is quick to ignite, and vaporises at only 10-12°C," explains Øyvind Vormedal, who has worked on this project at the NMA with Raymond Lone and Kolbjørn Berge. "Robust piping and closed systems will ensure that the liquid doesn't escape and pose a safety risk."

The trio report that great emphasis has been placed on safety, and experience will show whether these standards can be relaxed.

A high level of creativity in the industry is welcomed by the NMA, which aims to help find positive solutions for good projects.

"Proposals are usually well thought-out before they reach us," says Vormedal. "We're not meant to be obstacles, but to be positive and help realise sustainable projects."

## Powering ahead

**BATTERY OPERATION** is frequently in the news in maritime fora. What will probably be the world's first battery-powered fishing smack is due to launch this summer, while the Eidesvik shipping company recently reported that it will be installing an energy storage system in *Viking Queen*.

"This will be the first offshore vessel to get such a system installed as a retrofit solution," Eidesvik said in a press release. "[It's] thus a milestone for environmental focused activity offshore, and shows that it is possible to achieve [a] significant reduction in emissions also for existing vessels."

Work on groundbreaking technology has also been pursued in Trondheim. A decade of collaboration between Sintef, Siemens and boat-builder Selfa on environment-friendly solutions for fishing vessels has yielded the world's first battery-powered smack.



### Hvordan skape konkurransefortrinn gjennom grønn vekst?

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PHOTO: PER LARS TONSTAD

## Busy days for the scrutinisers

# Working to keep everyone safe

The mood is jovial but with an underlying seriousness when the NMA inspectors board the *Goalsevarre* ferry in Tromsø. They have a long checklist to get through.

“Safety is the most important consideration,” says NMA principal surveyor Hans Trygstad Johansen. “Passengers, shipping companies and society all benefit from us doing a good job.”

*Goalsevarre* carries cars and people over the Lyngen Fjord, where the weather can be very rough. The owner issues a self-declaration about its condition every year, and the inspectors are checking to see that this accords with reality. Any deviations are noted and must be corrected.

Like the rest of the Norwegian coast, maritime traffic around Tromsø is intensive, as national and foreign ships large and

small head for their destinations. This traffic must be secure, and the vessels need to have the necessary certificates and meet legal requirements on outfitting. The inspectors also check that a ship’s condition is satisfactory and that maritime regulations are observed.

Vessels are generally in better condition today than they were a few years ago, explain Johansen and inspectors Tor William Johannessen and Tom Hartvigsen from the NMA’s Tromsø office. “The owners know what’s required, and we seldom come across really serious contraventions,” says Johansen.

### Automatic identification

The team can follow maritime traffic in their area via the computer. More and more ships are installing an automatic identification system (AIS), which means their name comes up on the monitor. A couple of keypresses is all the inspectors need to check the history of and data about the vessel.

Port state inspection is an important tool for ensuring safety at sea. Ships in poor condition are a danger to themselves and others, and must not be allowed to sail. The inspectors pay both scheduled and unscheduled visits, and devote particular attention to old acquaintances where problems have been found before.

“We don’t want to use punitive sanctions and possibly detain ships,” Johansen emphasises. “That’s always the last resort.

We need to exercise a certain amount of judgement, but must constantly be assured that the regulations are being observed.”

*Goalsevarre* will soon be ready for the sea. The inspectors have identified some problems, and master Daniel Fagerborg outlines the improvements made. The hull has suffered wave damage, and new plates are being welded in place. Once the ferry is back in the water, the inspectors make a final check and it can return to service.

The inspectors monitor day-to-day traffic and decide for themselves which ships to look at. But they often receive tip-offs. “A pilot may react to something and notify us, for example,” says Johansen. “Members of the public are also observant and get in touch. We follow such reports up.”



**THOROUGH CHECK:** Principal engineer Hans Trygstad Johansen (right) and his colleagues make a thorough check of the Goalsevarre ferry, which sails the rough Lyngen Fjord in Troms county. They get a positive reception from master Daniel Fagerborg.

PHOTO: PER LARS TONSTAD

### No judging by appearances

Port state control involves various levels of inspection. The least extensive means that the inspector tours the ship, and checks documents and certificates. If something looks amiss, they ask for more details and may conduct a total review. An expanded inspection can take all day and also means that lifeboat or fire drills must be conducted. In addition, the inspectors check compliance with regulations on working time and rest periods.

Many years of experience mean the inspectors know they must not judge a ship by its appearance. A company may not be

able to afford to paint its sides, but that does not necessarily mean a vessel is in poor condition.

“Some foreign trawlers and cargo ships can look worn and ugly,” says Hartviksen. “But when we check Russian vessels, for example, which are numerous up here in northern Norway, we often find they have better rescue equipment than a Norwegian ship. One of the finest engine rooms I’ve seen in this job was on a Russian tanker.”

The inspectors feel welcome on most vessels, although the mood may get a little tense if they find many faults. They can never afford to compromise on safety, and

the shipping companies know that trying to get away with anything is useless. Johannessen chuckles as he recalls a master who wondered if they could take a short-cut and fix things between them.

“It’s incredible what can be arranged with a box of pollock,” was his response. He got no fish, but the company received a batch of items to fix.

The team find that crew are pleased they do a thorough job on board. Seeing people in the NMA’s uniform has a preventive effect. The inspectors seek to gauge the mood among the crew. Some may be dissatisfied about something, while the

owner is perhaps interested in seeking cheap and easy solutions. Identifying such conflicting interests can be important.

Inspections have been expanded as requirements become more numerous and detailed. Environmental aspects get greater emphasis than before. Oil samples must be taken, for example, to check the sulphur content – big fines are levied if somebody tries to run on poor-quality fuel close to the coast.

“Safe operation at sea benefits everyone,” says Johansen. “We do what we can to prevent accidents and harm to life, health and the environment.”

# Leading supplier of maritime safety

“We work hard for maritime safety and seek to be an innovative and advanced developer who complies with the regulations and has good products.”

Survitec scored yet another victory with the contract from Statoil to deliver safety equipment to the prestige Johan Sverdrup project in the North Sea.

“This will be our largest single order of its kind,” says Bjørn Nogva, sales and marketing manager for Survitec Norway AS. He adds that the contract was secured on the basis of the company’s technical expertise and ability to execute a delivery where the requirements for documentation are as important as the actual product.

Survitec is a complete partner for maritime safety and a supplier of fire, rescue and safety equipment to this industry.

“Our success on Johan Sverdrup may relate to weighting of price, but also reflects a focus on sectors which are stable and where documentation skills and history are significant factors,” says Nogva.

### Market leader

The Statoil order is the company’s largest single contract for a product delivery.

“But we have several large on-going service and maintenance assignments for evacuation solutions on ferries and passenger ships,” Nogva emphasises.

Survitec has developed and delivered evacuation solutions to more than 60 per cent of Norway’s passenger vessels as well as a large number of offshore and passenger ships in international service.

“We’ve also recently entered into contracts to deliver such systems to 11 new vessels, and telescopic gangway solutions to *Dr Fridtjof Nansen*, the new research vessel for the Norwegian Institute of Marine Research,” Nogva reports.

Since offshore vessels can spend more than a year at sea, the industry is keen to achieve longer servicing intervals for liferafts.

“We normally take these in for full testing every 12 months,” Nogva explains. “They’re inflated, pressure-tested and checked for wear, faults and damage. We also change water, rations and pyrotechnic equipment and check that everything works properly. We’ve accordingly developed liferaft solutions with 30-month service intervals.”



Johan Sverdrup. Artist's impression: Statoil.





# When a lifejacket did what it w

The storm had finally died away, and the sea off Feøy island near Haugesund was calm. Henrik Sjursen wanted to use this fine day early last December to look for some lobster pots which had disappeared in the bad weather.

An offshore worker who is at home on the sea, he set off in his 24-foot open motorboat, and naturally wore his lifejacket for safety's sake.

"The sea suddenly seemed to withdraw, and I heard a rumble," recalls Sjursen. "Then came the wave."

Man and boat were helpless when the billow struck aslant the bows. Nature's forces proved so much stronger.

"I ended up under the water and felt the lifejacket inflate," says Sjursen. "I was wearing plenty of clothes, and my heavy protective boots didn't exactly make swimming easy."

His boat had capsized, and Sjursen eventually managed to crawl unto the upturned hull. He sat there and felt a trifle worried about his possible fate. Inhabited land was a long way off and no other boats could

be seen. The thought struck him that this might be the end.

"My mobile phone was in my pocket," he says. "Incredibly, it still worked. I managed to dial the number of my cousin, who didn't live so far off. He undoubtedly understood what I said, but I couldn't hear him. It nevertheless kindled hope that help was on the way."

### Kept afloat

Sjursen quickly realised that he could not stay on the keel until his cousin arrived, and the nearest island was not far away. He got back into the water and started swimming. His lifejacket kept him well afloat.

His heavy boots continued to plague him. He tried to kick them off, without success.

It took him perhaps 20 minutes to reach his destination.

"Heavy waves were crashing against the rocks," he says. "Getting ashore wasn't that easy. But I was glad to be wearing those boots now - I could get a good footing."

His cousin had been away from home when he got the distress call from the sea, so he had to ring somebody else and ask them to take action.

Sjursen had to brave the waves a third time in order to reach the boat which had turned up, and he now felt how much the struggle had cost him. His strength was beginning to fail, his body was chilled, he was stiff and exhausted. The rescue coordination centre had also been notified, and a helicopter was soon hovering over him.



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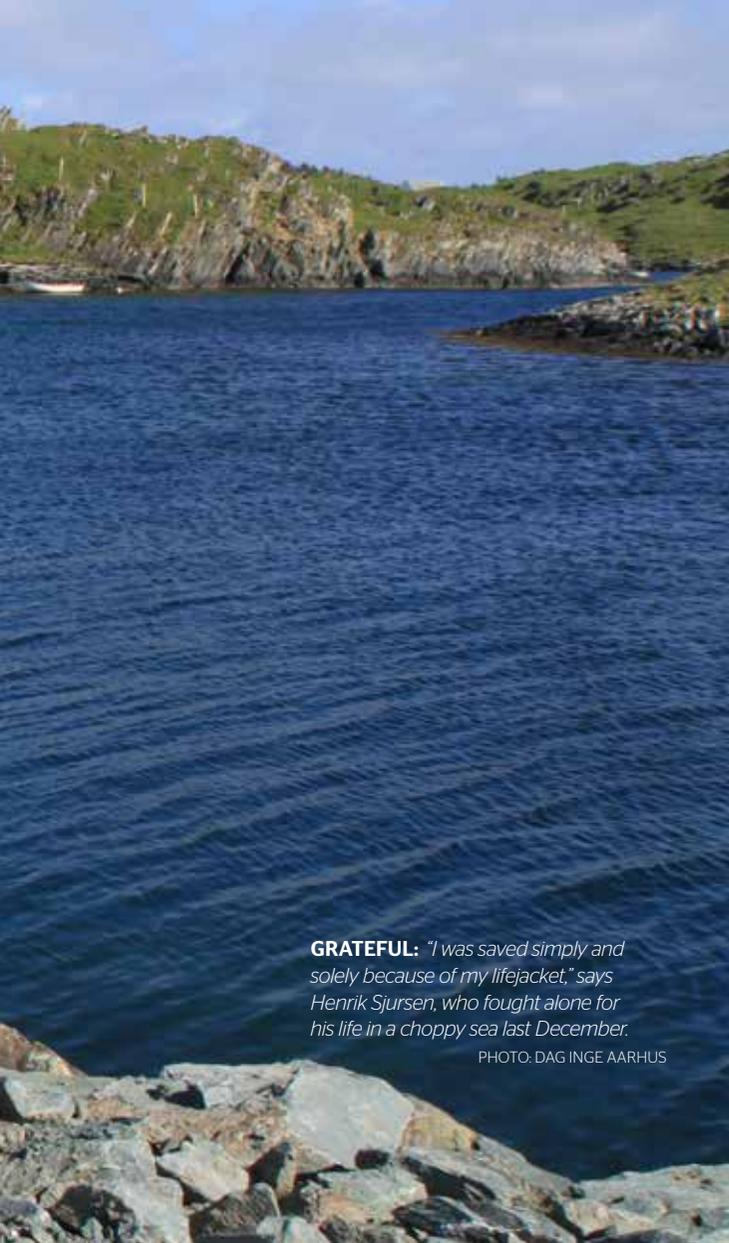


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**GRATEFUL:** "I was saved simply and solely because of my lifejacket," says Henrik Sjursen, who fought alone for his life in a choppy sea last December.

PHOTO: DAG INGE AARHUS



**FICKLE:** The weather can quickly change from idyllic to life-threatening, as Henrik Sjursen discovered.



# as meant to

"I was saved simply and solely because of my lifejacket," he concludes, and is happy that wearing such equipment is mandatory. He hopes everyone respects that law, which is a matter of life and health as well as respect for the sea and natural forces.

What could have been a tragedy had a happy ending. But that is unfortunately not always the case. Soon afterwards, the *Fremover* newspaper in Narvik reported a fairly similar accident. The difference was that the angler in an open boat only used a safety line. That was not enough – he was found drowned.

### Positive trend

Statistics show that the number of Norwegians killed in boating accidents fell from

34 in 2013 to 28 last year. The summer of 2014 was the warmest for a long time, and the level of activity on the sea was probably higher than usual.

Sixteen of the 28 who died last year did not wear a lifejacket, six did and the six others may or may not have done so. The figures also show that adult males are over-represented among the fatalities.

NMA head Olav Akselsen hopes that the positive trend will continue.

"We're maintaining our efforts to change attitudes on safety, including at the big boat shows," he says. "So are many other agencies and organisations. We're hoping for a great boating season, where people enjoy life on the waves and make safety a natural part of their planning."



**POSITIVE:** NMA head Olav Akselsen is happy with the decline in deaths from boating accidents, and hopes this positive trend will continue. PHOTO: STEINAR HAUGBERG



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# Simpler and more efficient services

A steadily growing proportion of the administrative procedures in the NMA, including the Norwegian International Ship Register (NIS), are now performed digitally. Constant efforts are being devoted to finding more efficient ways of working.

“The shipping companies want good and efficient services, and we must preferably be ahead of developments,” explains Anita Malmedal, head of the ship registers in Bergen.

Together with her 19 staff, she is concerned to maintain a service-oriented organisation. But the Norwegian International Ship Register (NIS) has sailed in rather turbulent seas since the mid-1990s. Its registered fleet has declined steadily, from 917 vessels in 1991 to 522 at 31 December 2014.

“We’re very pleased that numbers now appear to have stabilised,” says Malmedal. “Ships under the Norwegian flag have risen to 529 since 1 January, and it’s particularly gratifying that Viking Cruises has chosen to register its new *Viking Star* cruise ship with us. The last cruise ship flagged out from Norway a decade ago.”

## Digitising

The NIS has made big efforts to simplify its administrative procedures, she reports,

with digitisation as the key.

“We’ve introduced a number of new electronic solutions, not least for issuing certificates. The reimbursement process is completely computerised. And we accept electronic submission of a number of documents when registering.”

The NMA’s emergency response has been expanded to cover more than reports about accidents and serious incidents at sea, Malmedal notes. Company contacts have been established, so that customers deal with just one person. And a dedicated team for new registrations is geared up for more customers.

She says that the modernisation process is not over, and that more digital solutions are in the pipeline. “We must offer a modern service which can compete with other registers. Our aim to be as accessible as possible to our customers. Digital solutions mean that shipping companies can have their requirements met quickly and efficiently, regardless of where they are in the world.” She adds that

the NMA is constantly seeking ways of saving time internally and externally.

## Ambitious goals

A number of contact meetings have been held with companies by the ship registers to learn where problems exist. The NIS has failed to share in the expansion of the world fleet in recent years. While shipping is a conservative industry, it is very innovative in technological terms. Many people have felt that the NMA is characterised by slow procedures and cumbersome bureaucracy. The basis has now been laid for making the NIS more attractive to companies.

“A strong NIS also gives Norway greater weight globally, including in the important work of the International Maritime Organisation (IMO),” Malmedal emphasises. “We now get much positive feedback from customers. Our main vision is to be the preferred maritime administration – we will be visible, competent and customer-oriented.”

One goal of a new strategic plan for 2016-



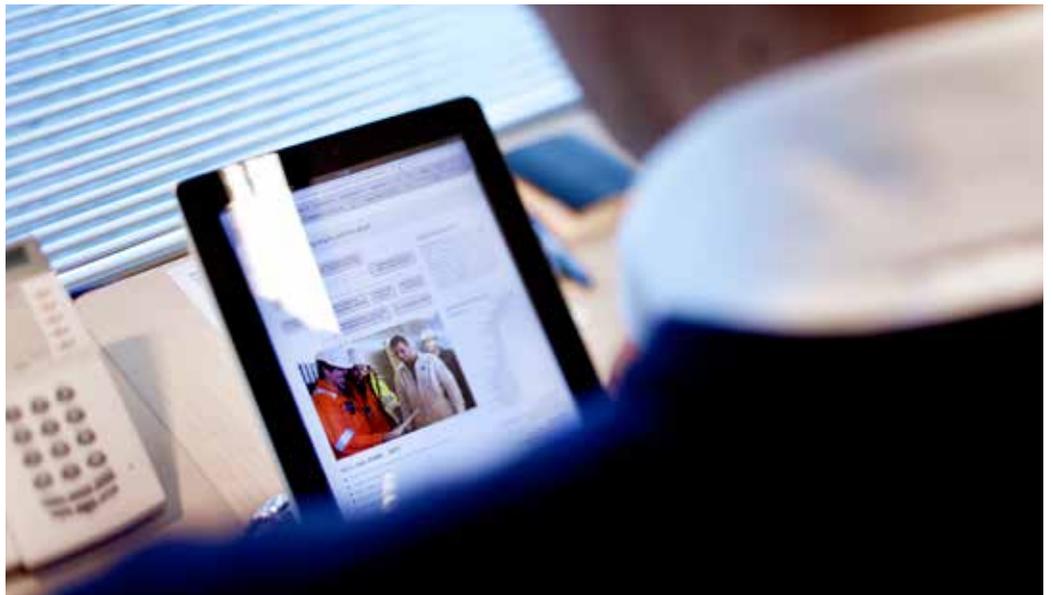
**NEW TREND:** Department head Anita Malmedal is pleased that the decline in NIS-registered ships has ceased. “We’re making our services more efficient in order to provide a better offer to our customers,” she says.

PHOTO: STEINAR HAUGBERG

19 is to raise the share of the Norwegian-controlled fleet in the NIS from about 40 per cent today to 65 per cent.



**ONLINE:** An expanded emergency response and an increase in digitised services make the NIS more attractive to a growing number of shipping companies.



ALL PHOTOS: HAAKON NORDVIK



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# Prepare

The NMA's emergency telephone is staffed around the clock throughout the year. Should a ship under the Norwegian flag find itself in difficulties anywhere in the world, duty staff in Haugesund are ready to help.

"It's often possible to resolve matters there and then," says Alf Tore Sørheim, section head for inspection and emergency preparedness at the NMA. "Many things can't wait until the next day. Keeping a vessel in service is crucial for shipping companies – delays mean lost revenue."

Norwegian registration provides a guarantee that help from the NMA is never far away. The emphasis is on ensuring that the emergency phone is staffed by competent personnel who can access the right databases, quickly call up a certificate or

respond fast to a possible application for exemption.

"Feedback we've received indicates that the level of service and accessibility can vary under certain other flags," says Sørheim. "We want Norwegian ships to sail as long as their safety is good."

Companies with ships under foreign flags have occasionally been tempted to seek help from the NMA, but must then be referred to the country of registration. The Norwegian authorities cannot issue an exemption, for example, when the ship



PHOTO: STEINAR HAUGBERG

# d to assist

# - day and night

is sailing under another flag.

Sørheim is pleased that the NMA can now offer an expanded emergency response to companies with ships registered in Norway. This service was previously confined to reporting accidents or serious incidents.

### Threshold

Asked whether a threshold exists for emergency help, Sørheim says that it should only be requested for urgent matters. "Examples could include a case where our

support can ensure that a ship is allowed to continue sailing and avoid unnecessary delay. Since Norwegian ships operate worldwide in all time zones, a 24-hour service is important. Most people appreciate being able to speak to a competent staffer ready and able to help. If a ship is unfortunate enough to go aground, it's reassuring to talk with somebody who understands the position and can give good advice. The duty officer can contact the right technical department and get most things dealt with. But we can never com-

promise on safety – that's the basis for all our decisions."

Feedback from Norwegian companies indicates that they greatly appreciate the expanded emergency service.

"That's been called for and is now in place," says Sørheim. "We're pleased to be able to provide it. Our support can make the difference between permission to continue or being detained. The latter puts a negative stamp on the ship – having vessels with a clean record is a competitive advantage."



**AROUND THE CLOCK:** Since Norwegian ships operate worldwide in all time zones, being able to offer a 24-hour service is important, says Alf Tore Sørheim. PHOTO: STEINAR HAUGBERG



PHOTO: STEINAR HAUGBERG

# Necessary renewal of boat operator training

Some 15 000 Norwegians take the country's boating licence test every year. The curriculum for this examination has now been updated and tailored to the way people spend leisure time at sea today.

"Attitudes have become more important," explains NMA surveyor Heidi Therese Bless. "The Safe Boating rules have been incorporated in the curriculum, for example. Mod-

ern pleasure boats are faster than before, so knowledge of navigation, reaction times, tunnel vision and delays when using electronic equipment at high speed is important."

Accident prevention gets emphasised in the new curriculum, which came into force on 1 March. The candidate must know more about safety equipment, such as the dead man's switch, boarding systems and drogues. Meteorology has been added, so questions could be asked on weather and wind, sea conditions and visibility.

Requirements for calculating magnetic variation and compass deviation have been reduced and the sample calculations elimi-

nated. It is sufficient now to know what these terms mean and to take them into account.

"It's more important to be able to use GPS, VHF and mobile phones, and to be aware of the opportunities and restrictions provided by these aids," says Bless.

Overall, the new curriculum is intended to equip boat operators to act safely at sea. Respect for others on the water now receives emphasis.

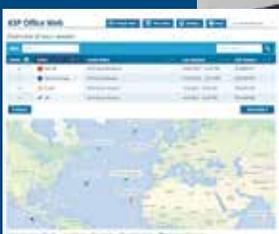
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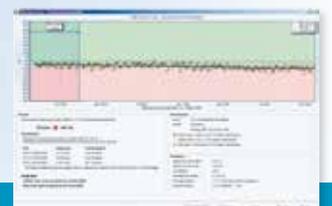
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Performance Analysis

## Making it easier to build in Norway

**NEW RULES** related to the Norwegian Guarantee Institute for Export Credits (Giek) could secure more work for Norway's shipbuilders. "We want Norwegian yards to build more vessels," says trade and industry minister Monica Mæland. "We're accordingly making it possible for Giek to guarantee additional contracts for such jobs." The institute provides its guarantees on behalf of the Norwegian state. These changes were introduced from 1 May in connection with the government's new maritime strategy.



**BOAT OPERATOR LICENCE:** 78-year-old Harald Blindheim (left) proudly receives his licence from instructor Bernt Nilsen. PHOTO: NORSK TEST AS

### Wants more to qualify

Every Norwegian resident born after 1980 must hold a boating licence to be able to operate a pleasure boat between eight and 15 metres long or with a motor of more than 25 horsepower. But the NMA recommends that people operating boats also take the course and test regardless of their date of birth.

"Many older and experienced boat operators say they already have the required skills and don't need the licence," observes Bless. "But this tests them on updated knowledge, such as navigation, beacons and the rules which apply at sea. If you're going to hire a boat abroad, too, you may be asked for a licence even if you don't need one in Norway because of your age. And it's no use contacting the NMA and boasting about your long experience in an effort to get a licence issued – you've got to take the test."

Candidates can take the test without the course. But most of the people who complete the latter find it useful and educational, and many different programmes and venues are available nationwide. The actual test involves answering 50 questions in an hour.

A Norwegian boat operator licence provides the basis for acquiring an International Certificate for Operators of Pleasure Craft (ICC). This involves an additional practical test and a self-declaration on the applicant's health.

The pleasure-boat skipper licence is the



**NEW CURRICULUM:** Taking the boat operator course is useful even for older and more experienced pleasure-craft users, says Heidi Therese Bless. PHOTO: BJARTE AMBLE

level above the boat operator licence, and permits the operation of vessels 15-24 metres long in defined areas. Two new subjects have been included in the curriculum for this certification, covering vessel handling and practical use of navigational aids.

In practice, this means that a boat must be used in the training. All course providers must therefore secure a suitable vessel if they are to offer teaching in the new subjects. The curriculum still calls for 120 hours of study. Both old and new curricula can be used until 1 January 2016, after which only the new one applies.

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# Groundbreaking technology without chemicals

New technology from Enwa contributes to reducing chemical use on board and a better environment.

Norwegian company Enwa can now finally present a “self-cleaning” evaporator – water production entirely without the use of chemicals – in Norway. This product has been developed by Danish maritime specialists, with attention concentrated on chemical-free water output, small footprint and minimum need for space in connection with maintenance and service.

“Chemicals have traditionally been used, and crew have had to wear both gloves and eye protection when handling these,” explains Peter Eriksson, Business Development Director at Enwa Water Technology AB. “That’s no longer necessary. The Enwa Fresh Water Generator (FWG) with ScaleGuard technology eliminates the need to inject anti-scaling products and substantially reduces maintenance requirements. We can now offer our customers produced water at a lower cost than conventional FWGs.” He emphasises that the company is very pleased to be able to present the latest addition to its product portfolio, which is better for the environment, cuts work for the crew and reduces time and cost.

“Three methods are available for securing fresh water on a vessel – bunkering from shore, a fresh-water generator on board or a water-maker using a reverse osmosis (RO) process,” Eriksson explains. “We have long experience of designing and building RO solutions at our Swedish factory.”

Enwa’s patented EnwaMatic® technology, developed in-house, is winning ever more admirers, and almost 5 000 installations can be found on ships and offshore installations and in buildings. Put sim-

ply, this involves filtering the water and treating it with processed minerals. Particles are removed and water properties balanced to make it non-corrosive and avoid deposition and bacteria. Appropriate and chemical-free water treatment gives better energy transfer, lower power consumption and reduced maintenance costs.

## New ballast water treatment

The shipping sector carries more than 80 per cent of the world’s raw materials and annually transfers almost three-five billion tonnes of ballast water internationally. Such water is essential for safe and efficient operation of modern ships, providing balance and stability in unladen condition. However, it can present serious threats to ecology, economics and health.

“Thousands of marine species are carried in ballast water, spreading lifeforms to areas where they are non-native,” says Eriksson. “Both Japanese oysters and king crabs are examples.”

These invasions of new organisms can threaten local ecosystems and are one of the four biggest threats facing the world’s oceans.

“An international convention on ballast water treatment is expected to come into force within a year, but a number of shipping companies have already adopted systems to meet the coming requirements,” Eriksson notes. “We are the agent and distributor for the OceanGuard Ballast Water Treatment System (BWTS), which utilises free radicals to kill all life in the water. It’s so efficient and effective that treatment is only needed when ballasting.”

This unique technology is supplemented by the system’s low power consumption and small space requirements. So confident is the manufacturer in its own solution that it guarantees the system will meet US Coast Guard requirements even before all tests have been completed.

Enwa is a turnkey supplier of systems and products for water treatment on land and at sea. Demand for more and cleaner water is growing.

“We’re working continuously to meet this requirement and ensure that our solutions create real value for our clients,” reports Eriksson, before noting that more information is available on the website at [www.enwa.com](http://www.enwa.com).

• THE ENWA GROUP comprises a number of companies with water as their core business. Water Technology is one of three divisions, serving the offshore and marine markets as well as land-based industry and property.

• THROUGH CONTINUOUS development and by concentrating attention on value creation at customers, Enwa is constantly enhancing its services and has moved in recent years from being a product supplier to become a provider of system and service solutions.





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Visit the companies at: [fredolsen.no](http://fredolsen.no), [bonheur.net](http://bonheur.net), [ganger-rolf.com](http://ganger-rolf.com) or call : (+47) 22 34 10 00.

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PhD students prepare an experiment.



Speed trial during the Ocean Space Race.

# Ocean space technology provides an ocean of job opportunities

Norway is among the world leaders in marine science, technology and industry. About 40 per cent of value creation comes from the sea. Norway is an oceanic nation. New knowledge and innovative technology are needed to ensure the future sustainability of activities at sea and in the ocean space, and that will depend on involving today's youngsters.

The department of marine technology (DMT) at the Norwegian University of Science and Technology (NTNU) teaches and conducts research on methods and techniques which make it possible to evaluate and develop technical and operational solutions for the nation's largest export industry. The MSc course in marine technology is a five-year programme with a common curriculum for the first two-and-a-half years, followed by one of eight specialisations.

"Interest in marine technology studies is great and the level of applications high," says professor Bjørn Egil Asbjørnslett at the DMT. "To help retain a leading world position in the subject, we want to motivate and recruit more students and organise the annual Ocean Space Race vessel design competition here at Tyholt in Trondheim," adds professor and DMT head Harald Ellingsen. "We'll be contributing this June to the Ocean Talent Camp outside Oslo City Hall."

Marine technology has traditionally been a male subject, but women accounted for about 45 per cent of last year's student intake. The course also attracts many foreigners to the Tyholt campus, which is characterised by a good and vibrant international student community.



Students building a ship model.

## Research

The Centre for Autonomous Marine Operations and Systems (AMOS), a world leader in its field, is one of four new NTNU centres of excellence. It will help to develop intelligent ships and ocean structures, and autonomous unmanned vehicles under water, on the surface and in air. Developments will also cover robots for high-precision and safety-critical operations in extreme environments. This is necessary in

order to meet challenges related to the environment and climate, safe maritime transport, mapping and surveillance of large ocean and coastal regions, offshore renewable energy, fisheries and aquaculture as well as deep-sea and Arctic oil and gas exploration.

The department also participates in several centres for research-driven innovation, including two together with Ålesund University College, which will become part of the NTNU in 2016.

MSc graduates have a unique opportunity to become one of more than 100 PhD students in the department every year. Marine technology graduates enjoy an ocean of job opportunities in a varied industry.

## Ocean Space Centre

"We now hope and expect that the government will give the green light for building the Ocean Space Centre as tomorrow's knowledge hub in its field," says Ellingsen. "The marine technology centre has been and is the largest civilian educational and research facility for this subject in the western world." Asbjørnslett adds: "This will be extended with the Ocean Space Centre and carry Norway into the future."

## KRIGSSEILERREGISTERET

### - alle krigsseilere får hver sin hjemmeside

Det nye nasjonale Krigsseilerregisteret skal inneholde opplysninger om alle norske menn og kvinner som under andre verdenskrig seilte for Nortraship - i hjemmeflåten, i marinen, for allierte og nøytrale handelsskip og i alliert marine. I tillegg skal også utenlandske sjøfolk som seilte for Nortraship og i hjemmeflåten, registreres. Krigsseilerregisteret er under utvikling og vil bli lansert i august/september 2015. Her vil alle krigsseilere få sin egen «hjemmeside». Stiftelsen Arkivet i Kristiansand og Lillesand Sjømannsforening/sjohistorie.no utvikler Krigsseilerregisteret i samarbeid, med god støtte fra Samlerhuset Norge AS. I tillegg bidrar følgende sjømannsforeninger i en nasjonal dugnad for å realisere prosjektet:

#### Aust-Agder:

Risør og Lyngør Sjømannsforening  
Tverdalsøen Sjømannsforening  
Arendals Sjømannsforening  
Grimstad Sjømannsforening  
Lillesand Sjømannsforening

#### Hordaland:

Bergens Skipperforening

#### Møre og Romsdal:

Aalesund Skipperforening

#### Oslo:

Oslo Sjømannsforening

#### Rogaland:

Haugesund Sjømands- og Skipperforening

#### Telemark:

Brevik og Omegn Sjømannsforening  
Skien Sjømannsforening

#### Vest-Agder:

Christianssands Sjømannsforening  
Mandal Sjømannsforening  
Farsund Sjømannsforening

#### Østfold:

Fredrikstad Sjømannsforening



«Krigsseilerregisteret er utrolig viktig for alle pårørende som søker etter informasjon om slektninger som var krigsseilere.»

Jon Michelet

1800 Norwegian  
ships and rigs  
in action around the world



Norway has a long and proud maritime history, and for over 150 years Norwegian shipping has been a major player on the world's oceans. Today, the Norwegian shipping industry is stronger than ever and the Norwegian fleet is one of the world's largest and most advanced.

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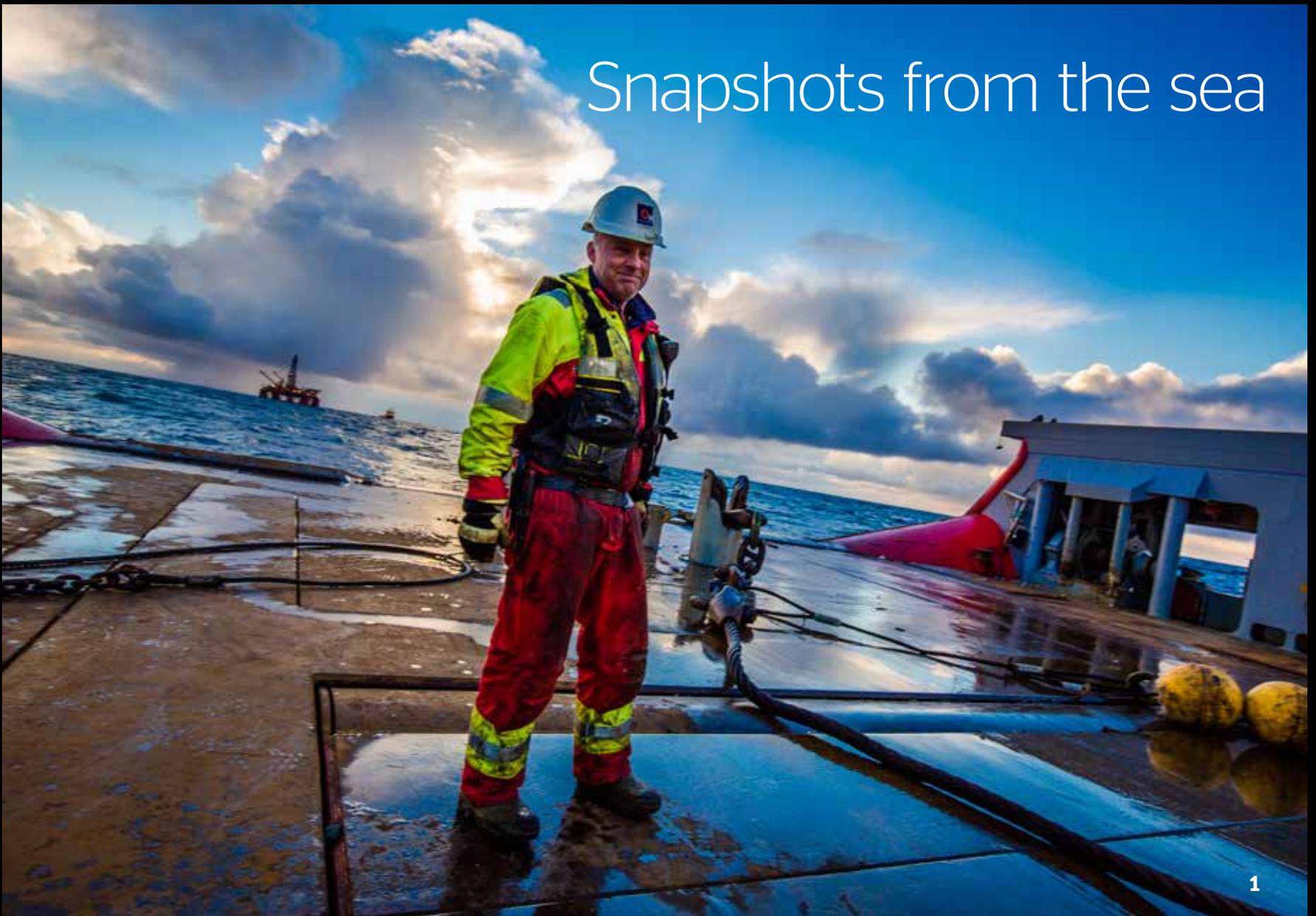
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# Snapshots from the sea



1

MASTER BJARNE HOVLAND, KL SANDEFJORD

Seafarers have a varied and interesting job, which puts them in close contact with weather and natural forces. The NMA stages an annual photo competition for seafarers, and shots of various working conditions took the prizes last year. The 15 best images are automatically entered in a Nordic final.



2

MASTER MIKHAIL CHULANOV, WILSTON GARSTON



3

SEAFARER ANDREAS WOLDEN, KL SANDEFJORD



4

FIRST OFFICER JONATAN SVENSSON, EIDESVIK RESOURCE POOL



5

FIRST OFFICER JONATAN SVENSSON, EIDESVIK RESOURCE POOL

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”

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going vessel from  
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suits anyone turned  
off by the new breed  
of mega ships.

”

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