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21ST CERTURY PLACED Reception Facilities D GCSA fully supports of the Directive to prevent discharges of ship-ge

What is the maritime industry doing to help rid our oceans of toxic plastic waste? In this special feature, **Sarah Robinson** investigates...

n late 2017, the BBC broadcast its powerful new wildlife documentary series Blue Planet II. Viewers worldwide were enchanted by the strange and beautiful images of sea creatures and their underwater world – and then found themselves recoiling in horror as the footage revealed how discarded plastics are polluting the marine environment.

The problem of plastic pollution in the oceans has been building for years, but it took this documentary, presented by Sir David Attenborough, to bring the issue to widespread public attention. And it's not just

about unsightly garbage; plastics are killing ocean wildlife by getting into the food chain. The documentary showed, for example, how ingested plastics could be responsible for a decline in albatross numbers; and most memorably, filmed a dead whale calf which may have been poisoned by plastic-derived chemicals in its mother's milk. Shocked into action by **Blue Planet** II, thousands of people have pledged since the broadcast to keep plastics out of the sea by picking up litter on beaches. In addition, long-standing campaigns to reduce plastic waste have received a boost, with new supporters joining and businesses and government coming onboard.

If many people are now trying to do their bit shore-side, what's happening in the shipping industry? We know that most marine litter originates from land-based activities, but shipping uch as

need to play their part

in ensuring waste from

50% marine litter is

ine litter is ht to come maritime purces to come up in the water – and maritime regulators have an important role here too

an important role here too. In January this year, the European Union launched its first-ever plastics strategy, which includes new rules on port reception facilities for marine litter, along with promises to reduce the administrative burden on ports, ships and competent authorities.

The European shipowners' body ECSA has welcomed this 'long-awaited' revision of the Ports This picture, taken in 2017 in heavily polluted Indonesian waters, went viral on the internet and helped to raise awareness of the plastic waste problem Image: Justin Hofman www.justinhofman.com Reception Facilities Directive. 'ECSA fully supports the aim of the Directive to prevent illegal discharges of ship-generated waste and cargo residues into the sea by encouraging vessels to discharge all waste to shore-side receptacles,' said secretary general Martin Dorsman.

Nautilus general secretary Mark Dickinson also hailed the revised legislation, commenting: 'Whilst plastic pollution generated on land quite rightly garners a lot of attention, it is estimated that in some areas as much as 50% of marine litter is maritime-based. Nautilus hopes that this revision will be effective in incentivising shipowners and ports to take their responsibilities seriously, therefore facilitating seafarers in their efforts to minimise marine pollution'

Disposing correctly of shipboard waste is surely the very least that seafarers and shipping companies can do. But the industry can go further than this, by supporting projects to stem the flow of landgenerated waste reaching the sea. And perhaps most excitingly, the skills and ingenuity of maritime professionals can be deployed to help reverse the problem – actually cleaning the oceans of plastic pollution.

Over the next few pages, we will see how individuals and companies in our industry are making a difference, whether on a local scale or in ambitious international projects. This is of course just a taste of what maritime professionals can contribute to the effort to rid our oceans of waste plastic, so if you would like to tell Telegraph readers about other projects, please write a letter to the editor via telegraph@ nautilusint.org, or at the postal address given on page 6.



Volunteers from the GreenSeas Trust giving out leaflets and portable beach ashtrays in Cannes

Laura Monica Carusato's winning design for the BinForGreenSeas competition



BinForGreenSeas design competition winner Laura Monica Carusato (centre) flanked by the judging panel, L-R: Darren Wingrove, project manager at Logoplaste Innovation Lab; Biffa business development manager Karen Sherwood; Fazilette Khan, founding trustee of the GreenSeas Trust; Edina Seiben, GreenSeas Trust project coordinator



GreenSeas Trust – binning plastics on the beach

Fazilette Khan has spent much of her working life thinking about marine waste management. Of her 30 years as a seafarer and Nautilus member, she spent nearly half as an environmental officer on cruiseships. And since coming ashore for good last year, she has devoted herself to the GreenSeas Trust, the UK-based environmental charity she founded in 2002.

The charity actually came about before the shipboard environmental job, Fazilette explains: 'I was still working as a radio officer when I happened to go on holiday to Tobago and noticed how much rubbish people were dropping on the beaches and in the sea, especially plastic waste. I just had to do something about it, to help the country where my mum came from, so I worked out a plan to get local support for a cleanup. I thought people would take me more seriously if I was from a charity, so I registered the GreenSeas Trust in memory of my mum, Haida Khan.'

With Fazilette's energy and fierce determination behind the cleanup

project, the beaches of Tobago were soon looking much better. The solution wasn't difficult, she stresses: 'We just had to put bins on the beaches! An oil company donated oil drums to turn into bins, and local volunteers helped me paint them so they'd be attractive and eyecatching.'

The GreenSeas Trust persuaded the local authorities to empty the bins regularly and start a recycling programme for much of the waste. Fazilette and her volunteers also carried out educational work to encourage local people to use the bins. 'I remember we went into a school once in Tobago and this 14-year-old girl was very resistant to our message until she realised that her own future work prospects in tourism would be affected by dirty beaches and seas. It was like a light going on. Whether it's tourism, fishing or shipping, everybody who makes a living from the sea is harmed by pollution.'

With shipping companies phasing out the role of radio officer, Fazilette was in need of a new job, and her experience with the GreenSeas Trust made her a good fit for one of the recently-created environmental officer posts at Princess Cruises. The work involved processing and disposing correctly of all shipboard waste, from engine oil and used cooking fat to general garbage. Fazilette organised recycling and re-use wherever possible, and even found charities ashore to take her vessel's discarded mattresses.

Meanwhile, she was still working on volunteer projects with the GreenSeas Trust during her shore leave, including an initiative in the French resort of Cannes to persuade tourists not to leave cigarette butts on the beach. 'People think cigarettes are biodegradable, but they're not, because they have plastic in their filters. We gave out leaflets to tell people about this, along with free portable beach ashtrays supplied by the local council.' The latest GreenSeas initiative has been to run a competition for product design students at the University of East London to come up with a special bin for use on British beaches. The BinForGreenSeas project is supported by Arun District Council on the south coast of England, and sponsored by waste contractor Biffa.

The competition winner, announced in January this year, was Laura Monica Carusato, with a design based on the funnels of classic ocean liners. 'We wanted something distinctive and fun to use, and Laura's design really fitted the bill,' says Fazilette.

Laura adds: 'It's designed so people don't just place or drop plastic waste in the bin, they throw it in, so it becomes something children and adults can enjoy, like playing basketball.'

The next stage of the BinForGreenSeas project is to get the eye-catching waste receptacles mass-produced and out to as many of Britain's busy beaches as possible. A suitable factory has been identified by the GreenSeas team, and many coastal councils around the UK are interested in maintaining and emptying the bins, but the project needs more sponsors to come onboard.

'We'll be approaching shipping companies soon,' says Fazilette, 'and there are multiple benefits from getting involved. As well as joining the essential effort to keep waste plastics out of the sea, they can gain wider public recognition for their brand, as sponsors' names will appear on the bins. Individuals can donate too, and every contribution will help; I firmly believe that what each one of us does creates a ripple effect that can change the world.'

To find more about the GreenSeas Trust and enquire about becoming a sponsor of the BinForGreenSeas project, visit www.greenseas.org or email info@greenseas.org



The Sunnyside Ocean Defenders on a visit to the CalMac ferry Caledonian Isles last month

#NaeStrawAtAw – convincing ferries to cut plastic waste

Young environmental campaigners from Glasgow have enlisted Scotland's best-known ferry operator, Caledonian MacBrayne, in their campaign to ban disposable plastic straws.

Single use plastic straws are particularly problematic because they can't be recycled

Known as the Ocean Defenders, the group from Sunnyside Primary School have highlighted drinking straws as a classic example of damaging single-use plastics: unnecessary,

wasteful of resources and, in this case, not even recyclable. They have been promoting their campaign #NaeStrawAtAw all around Scotland, and quickly caught the attention of the CalMac community board.

'When Sunnyside Ocean Defenders first got in contact with CalMac last year we knew we needed to hear more about their campaign,' said environmental manager Klare Chamberlain. 'The company is extremely concerned about marine litter and the blight it can have on the marine environment across the west coast. Their Ocean Defenders group provided both CalMac and the community board with an extremely informative presentation highlighting the dangers of singleuse plastics and provided us with samples of suitable alternatives which we could adopt.

'We have been working with our suppliers over the last year or so to identify alternatives to single-use plastics, and with our waste contractors to ensure than any alternatives can be suitably managed. I am delighted that CalMac Ferries can support #NaeStrawAtAw and ban plastic straws onboard, and look forward to spreading word of the campaign across the communities we serve.

'Our procedures are also changing so that straws are only available on request. All other sources of single use plastics on board are also under review and we hope to be able to announce further changes over the coming months.'

Seabin Project – trapping floating plastics in port

'If you can have bins on land, then why not in the water?' That, says Pete Ceglinski, was the thinking behind the Seabin, the marine waste-gathering system he created with his friend Andrew Turton. Both keen surfers and leisure sailors, they co-founded the Seabin Project because they were dismayed by the amount of rubbish building up in the oceans, and have spent the last three years developing and piloting their cleanup product.

Now CEO of the Mallorca-based company, Pete has a background in product design and boatbuilding for the yacht racing sector, so his expertise was invaluable in the development of the Seabin. The device is designed to be moored in a marina or port, sitting just under the waterline, with a pump at the bottom to pull in floating debris. This is then trapped in the bin until it can be emptied by local refuse services and the waste processed onshore.

'The trick is to place the Seabin in debris accumulation corners – and everyone working in a marina or port knows where those are,' says Pete. 'One of the most common things captured by the bins is plastic bags, but we also trap microplastics down to 2mm in diameter, and there are oil pads which are very effective at absorbing surface oil. And if a piece of debris is too large to be pulled over the rim into the bin, the suction from the bin's pump will keep it held against the side until it can be retrieved.'

Another design consideration has been the need for the Seabin to move up and down with the tide so its rim is always under the waterline. During the pilot phase, this has been achieved by mooring the device to floating docks, but later this year another model will be launched, suitable for fixed docks. This version will be attached to a vertical rail attached to the dockside, and will slide up and down the rail with the tide.

The Seabin's filters can trap microplastics down to a



the product's green credentials by operating each unit with a renewable power source such as a wind turbine or solar panels, and by increasing the percentage of recycled plastic in its manufacture.

A Seabin ready for installation in a marina Image: Seabin Project

The Seabin Project was started with the help of crowdfunding, and received a major boost when it won a grant for environmental startups from the Netherlands-based Booking Cares Fund. An important partner in the pilot phase has been the engine and ship systems manufacturer Wärtsilä, which became involved as part of its corporate commitment to the marine environment. Wärtsilä has sponsored Seabins in three ports in Finland, and plans to continue buying the device for ports in each of the countries where it has operations internationally. Other companies in the pilot include Pete's former UK employer, the yacht racing team Land Rover BAR.

Having successfully turned out hundreds of prototypes, the French yacht builder that manufactures the Seabin is gearing up for full commercial operation this spring. Pete would welcome approaches from more partners in the commercial shipping sector, especially those who could help with worldwide logistics. This project represents a break from the traditional narrative of environmental campaigning versus profit, he stresses. 'There is no enemy – we should all work together.'

To find more about the Seabin Project and enquire about becoming a partner, visit www.seabinproject.com or email contact@seabinproject.com

Ocean Cleanup – tackling the plastic problem on the high seas

In 2013, Dutch teenager Boyan Slat was on a diving holiday in Greece when he noticed that there was more plastic in the water than fish. Surprised that no one seemed to be clearing the rubbish up, he investigated further and discovered despair worldwide – people were saying the problem was impossible to solve.

Boyan had found out enough to acknowledge that a cleanup using vessels and nets would be unrealistic and even harmful to marine life. But he didn't take this as a reason not to act. He discovered that there are five major plastic accumulation zones in the world where ocean currents converge – commonly called 'garbage patches'. Boyan came up with the idea of developing a passive concentration system, letting ocean currents be the driving force behind catching and concentrating the plastic.

Boyan was so convinced that his idea was worthwhile that he left university during his first year to found The Ocean Cleanup. He won many supporters when his TEDx video presentation went viral on the internet, and in 2014 an international crowdfunding campaign collected over US \$2m to pay for research and development.

The Ocean Cleanup is now a substantial not-for-profit organisation based in the Netherlands, which has been manufacturing and testing 2km-long booms with collection sheets hanging underneath. Due to be deployed in the Great Pacific Garbage Patch later this year, these will move in the same way as the waste plastic in the accumulation zone, slowed by drift anchors at a depth where the current velocities are lower than on the surface. Thanks to this slower pace, the floating barrier will halt the plastic in its course.

Once the array of booms have



Water salute by the Boskalis supply vessel Union Bear after helping to install The Ocean Cleanup's prototype boom (foreground of picture) in the North Sea Image: The Ocean Cleanup collected enough plastic, a signal will be sent to Ocean Cleanup's mission control centre in San Francisco, and a vessel will be sent to pick up the collected waste and transport it back to land for recycling and responsible processing. The eventual aim is for the system to remove at least 50% of the waste plastic in the Great Pacific Garbage Patch.

Tests of the prototypes were carried out in the North Sea in 2016 and 2017 with the participation of Nautilus members at offshore supply company Boskalis, which is a major partner in the project. The North Sea was chosen for its extreme weather conditions, subjecting the booms to even more 0% pressure than they would encounter in the mid-Pacific. And for those wondering about the project's impact on international shipping, The Ocean Cleanup has issued the following statement: 'The moving systems will be equipped with Automatic Identification System (AIS), which is a maritime system allowing them to be noticed by ships and the other systems. They will also be equipped with

reflectors to make them show up on radar. This will allow for interruptions to be anticipated in advance and mitigate the possibility of collision.

'The Ocean Cleanup and ocean users must respect each other's rights while on the water. We are working with various stakeholders to determine the communication equipment needed, the cleanup systems' area restrictions and the notifications necessary to accommodate our activities and shipping simultaneously.

'The Ocean Cleanup is collaborating with Netherlands Institute for the Law of the Sea (NILOS), who in turn are in close contact with International Maritime Organisation (IMO). Together we can make sure parties crossing the Great Pacific Garbage Patch will be well aware of our cleanup efforts.'

To find out more about The Ocean Cleanup and follow the deployment of the system in the Pacific, go to **www.theoceancleanup.com** or search for **@TheOceanCleanup** on Twitter.

HEALTH & SAFETY

IN NUMBERS: SAFETY FIRST Classification society DNV-GL is analysing the use of scrubbers to clean up shipping emissions. It reveals that:



377 Ships in service at the start of this year fitted with scrubbers



Cruiseships are the vessel type making the most use of scrubbers: with a total of 135 being fitted



By 2022 the number of ships with scrubbers should increase to 416

E-NAVIGATION

Ferry trials new ship-shore information service

A DFDS ferry has been used to stage successful trials of a new e-navigation service designed to improve the flow of information between ships and authorities ashore.

The Danish-flagged Pearl Seaways was used as part of the validation stage of the European Union-funded Sea Traffic Management (STM) project during a voyage between Denmark and Norway last month.

In what was described as 'a great step forward for e-navigation', the 40,039gt ship sent its voyage plan to vessel traffic services centres in Norway and Sweden and received real-time safety

information in return, using the Maritime Connectivity Platform developed by the 38 project partners.

Modelled on air traffic control systems, the €43m STM initiative



The DFDS ferry Pearl Seaways tested the STM service

Image: Shared with other STM-enabled vesselsto help avoid close-quarters situations.
The validation project is due to be
completed by the end of this year and
will be tested on some 300 ships and in 13

suggestions.

is aiming to produce globally

harmonised digital services for

exchanging data between ship and

shore. The information sent by VTS

include recommended arrival times,

in the ship's navigation systems and

sections of voyage plans can also be

Information is displayed graphically

centres and port authorities can

navigational warnings and route

ports and VTS centres. The concepts will be further developed through two new projects, looking at traffic management and safety in areas that are busy or pose particular navigational challenges.

UNDER-KEEL CLEARANCE AID DIGITAL DEPTH SUPPORT

Danish and Swedish authorities have helped to launch a trial digital service which aims to help seafarers to safely assess the under-keel clearance of their vessels in challenging waters.

Developed as part of the EU-funded EfficienSea2 project, the test service uses detailed bathymetry, constantly updated tidal tables and weather reports to show 'comfort zones' and 'nogo areas' for ships with different draughts.

Project leader Christopher Saarnak, chief adviser at the Danish Maritime Authority, explained: 'It is all about making life more efficient for the navigator so that he or she can focus on manoeuvring the vessel. Rather than asking them to combine data from sea charts, tidal tables, weather forecasts and the vessel's draught, all while navigating the ship, our service would offer a way to do it automatically. In the end, it could free up valuable time for the crew.'

The service is being trialled in the sound between Denmark and Sweden, but the project team say it could be adjusted to include other parts of the Baltic Sea and, potentially, the world.

'The future perspectives for this kind of service are great,' said Mr Saarnak, 'The better the data becomes, the less stress will be put on the navigators when sailing.

'This kind of service will also need to be thoroughly implemented if autonomous ships are ever to truly take off,' he added, 'and we are happy to help them do so.'

Standard for MOB

The International Organisation for Standardisation (ISO) has drawn up a specification for man overboard (MOB) detection systems in a bid to improve safety at sea.

Aimed at the passenger shipping sector, the standard has been developed with the aim of producing internationallyagreed requirements for evaluating the effectiveness of MOB detection equipment.

The ISO said there are an average of 21 MOB passengership incidents every year – 'fuelling an industry that develops detection systems to raise the alarm and locate the victim as soon as possible'. Its ISO/PAS 21195 technical specifications cover the way such systems are expected to perform in a range of environmental conditions and incident profiles.

Robin Townsend, chair of the ISO subcommittee that developed the specification, said harmonised requirements should provide a strong foundation on which new technologies can be developed and feedback from the industry is being sought on the Organisation's plans to develop the document into a full International Standard.



46% Hybrid systems are the most popular type of scrubber



39%

Open loop scrubbers are the second most popular. Only 9% are closed loop

MEDICAL STANDARDS

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Colour vision tests change

The UK Maritime & Coastguard Agency (MCA) has announced that it is changing the method used to test for colour blindness in seafarers.

In its Marine Information Notice MIN 564, the Agency explains the decision to stop the current Holmes Wright B Lantern (HWB) supplementary tests for colour vision for deck personnel carried out at marine offices and to move to the Colour Assessment and Diagnosis (CAD) test, conducted by external agencies.

The MCA says the change is being made because the lanterns are no longer being manufactured. The CAD test – used worldwide by the aviation industry – measures the severity and type of colour vision loss, and reliably detects congenital deficiency, the M-Notice adds.

Nautilus professional and technical officer David Appleton commented: 'Nautilus welcomes this move. We believe the new test is a far more suitable method for assessing colour vision, both in terms of the accuracy of the test and in the practicality of administering the test considering the difficulties in maintaining the old equipment.

'As a matter of principle we believe that the small number of seafarers who are required to undertake this test each year should have the costs covered by the employer, as the test is part of the ENG1 medical certification process,' he added. 'Any member who fails an ENG1 medical at the first attempt is strongly encouraged to contact Nautilus immediately so that they may be guided through the appeals process.'

SAFETY PROJECT

DATA SCHEME TO CUT DEATHS

UK Chamber unveils techology to predict and prevent accidents

A new scheme which aims to dramatically cut seafarer deaths has been unveiled by UK Chamber of Shipping president Grahaeme Henderson, right.

The HiLo (High Impact Low Frequency) project has been developed by companies including Shell, Maersk and Lloyd's Register over the past three years and is a mathematical model that uses data from ships to identify patterns of unsafe events to predict and prevent major incidents.

Speaking at the Chamber's annual dinner, Dr Henderson – who is Shell's vice-president of shipping and maritime – said he was determined to cut the fatal accident rate in the industry, which is 20 times higher than the average ashore.

'It is simply unacceptable and needs action now,' he stated. 'That means all of us working together as one global team.'

Dr Henderson said HiLo is based on proven technology that has been used successfully in the aviation, rail and nuclear industries and he said it could prove to be a 'game changer' for shipping.

Data from smaller, seemingly non-threatening



incidents can be interrogated using HiLo. The analysis can then be used to target the specific areas in which safety should be improved onboard vessels in the fleets of individual shipping companies that subscribe to the scheme.

Gaslog, Maran Gas, Stena (Northern Marine), Stolt, Teekay, Torm, Tsakos Columbia Ship Management and V Ships are HiLo's founding members, and have been contributing incident data to the system during its preliminary stages.

'Working together, we can and we will, improve the shipping industry the world over,' said Dr Henderson.

Artificial intelligence on the bridge

The marine equipment firm Transas is harnessing artificial intelligence (AI) technologies with a new navigational support system which, it claims, will spot and prevent incidents caused by human error.

Described as 'an anti-collision support tool', the company's cloud-based system, A-Suite, has been designed to improve situational awareness and to inform – rather than take over from – seafarers' decision-making.

The predictive system uses machine learning to analyse the behaviour of crew members, comparing their actions with those previously collected from seafarers sailing in the same location. 'This, combined with a hydrodynamic model of the vessel and anti-collision regulations that have been coded into the system, provides "advanced decision support" for crew,' Transas said.

The system also records how and when operators interact with vessel controls, and the data can be used in post-voyage analysis and to improve seafarer training.

Transas says A-Suite has been designed with the aim of overcoming 'alarm fatigue' and the company claims it generates 'far fewer real-time alerts than other systems' by consolidating multiple standard alerts and providing recommendations on how to prevent the situation from escalating.

In brief

Companies fined: four

shipping companies – CSAV, K Line, NYK and WWL-Eukor – have been fined €395m by the European Commission for collusion in operating an anticompetitive cartel covering nearly 50% of EU vehicle imports and exports for almost six years. The fifth member of the cartel, Mitsui OSK Lines, escaped a fine as it gained full immunity by alerting the authorities to its existence.

Wages won: a dozen stranded Russian seafarers have been flown home after the intervention of the International Transport Workers' Federation and the Danish Maritime Authority secured the payment of US\$250,000 in owed wages for the crew of the Turkish tanker Natig Aliyev, which had been detained in Aalbæk, Denmark, since 7 February.

Total talks: French officers' unions have met the country's transport minister to discuss concerns over oil major Total's takeover of the Marseilles-based gas tanker operator Gazocéan. They said they remain concerned at the 'lack of clear guarantees' for French seafaring jobs in the fleet.

Chinese call: China has called for Japan and South Korea to help develop improved maritime emergency plans in the area following pollution caused by the loss of the Iranian tanker Sanchi after a collision with a bulk carrier in the East China Sea in January.

Arctic increase: shipping traffic on the Northern Sea Route will increase tenfold to 80m tonnes by 2025, Russian president Vladimir Putin has told the country's parliament.

Flag fears over ferries

Seafarer unions have protested to Norway's government over its plans to allow Color Line to switch ferries operating between Oslo and Kiel to the country's international ship register NIS.

The unions – CO-Søfart from Denmark, SEKO Sjöfart from Sweden and the Norwegian Seamen's Union – wrote a joint letter to business minister Torbjørn Røe Isaksen telling him the move would have 'dramatic long-term consequences' and threaten 700 Norwegian seafaring jobs.

Unions fear the flag switch – which requires regulatory clearance from the European Free Trade Association Surveillance Authority – would result in the use of low-cost foreign crews on the Color Line vessels and create unfair competition in the entire Nordic ferry market.

The unions urged the government to give the idea further consideration and analysis.



GERMANY AIDA'S FEMALE FIRST

Pictured above is Nicole Langosch, who last month became the first woman to take command of a German cruiseship.

Capt Langosch – who is one of 14 female officers serving in the 12-ship AIDA Cruises fleet – has been appointed master of the 71,304gt AIDAsol. She has served with the company for 10 years, after working for a container shipping company in New Zealand and for the European Parliament in Brussels.

'I am looking forward to my new role as captain and aware of its great responsibility,' she said. 'It makes me proud to work in a company that gives targeted support to young women in their careers, enabling me to pursue my dream job.' The Norwegian Labour Party, LO union confederation and Denmark's government have also expressed concern at the plans.

Danish shipowners and the Dansk Metal general union have agreed plans for expanding the country's international ship register (DIS) to include offshore ships operating in its national waters – with full bargaining rights for Danish unions.

The agreement is a breakthrough for the unions, as they have no bargaining rights for seafarers working on DIS vessels at present.

Anne Steffensen, director of Danish Shipping, said expanding DIS to cover all offshore activities was a necessary move for maintaining competitiveness. 'In that sense,' she added, 'we find it entirely reasonable that Danish conditions prevail in Danish waters, where many of these activities take place.'

Master jailed for dumping

A ship master has been jailed in the United States after pleading guilty to illegally dumping oil and garbage off the coast of Texas.

Captain Edmon Fajardo was sentenced to six months in prison and fined US\$2,000 after a court heard that oily cargo residues and machinery space bilge water were pumped overboard from the Marshall Islands-flagged tanker Sea Faith on five occasions in March 2017. Prosecutors said the master had twice ordered crew members to throw plastics, empty steel drums, oily rags, batteries, and empty paint cans directly overboard into the ocean.

The vessel's Greek operators, Sea World Management & Trading, were fined a total of \$2.25m and placed on probation for three years for failing to accurately maintain the oil and garbage record books. The company will also be required to implement a 'robust' environmental compliance plan.



Pictured with TNTA and TETA cadets are Young SMOU chairman Terence Tan; Maritime & Port Authority chief executive Andrew Tan; Singapore Shipping Association president Esben Poulsson; education minister Ng Chee Meng; SMOU general secretary Mary Liew; and SkillsFuture Singapore chief executive Ng Cher Pong

SINGAPORE

UNION HELPS DELIVER CADET INCREASE

Singapore is delivering a fresh S\$12.6m (€7.75m) funding boost for cadet training under an agreement between maritime unions and the government.

The three-year support programme has been delivered in a bid to train a further 200 Singaporeans as deck and engineer officers and to increase the size of the island state's maritime workforce.

The Singapore Maritime Officers' Union (SMOU) will work with two other agencies to provide the funding under the Tripartite Nautical and Engineering Training Award schemes. General secretary Mary Liew said: 'Together with the shipping companies who are providing training placements to the cadets, we are sending out a strong message that tripartism remains the right way to go as we navigate towards the future of maritime.'

SMOU will contribute \$\$5,000 to shipping companies it has collective agreements with for every training placement they offer to Singaporean cadets under the initiatives.

The union is also donating S\$120,000 to the local Mission to Seafarers over a three-year period to improve the welfare of seafarers visiting the International Drop-in Centre at Jurong Port. **3**

MOZAMBIQUE

AUSTRALIA

OSM SET TO BOOST AFRICAN TRAINING

A Norwegian ship management company is planning to re-launch a maritime college in Mozambique as part of its commitment to a United Nations programme to support corporate social responsibility.

The OSM Maritime Group is conducting a feasibility study on the re-launch of the Mozambican Higher School of Nautical Sciences as a 'centre of excellence' for training African seafarers, in line with its involvement in the UN Global Compact (UNGC) initiative. 'There's a demand for skilled seafarers in Mozambique, but a "competence gap" with regards to the local workforce,' said CEO Geir Sekkesaeter. 'The developing coastal shipping network, the fishing sector and the logistical needs of the offshore hydrocarbon industry have created real opportunity for Mozambicans, but they need the required competence.'

OSM said it is also developing a series of initiatives to increase the number of women in its global pool of 11,000 qualified seafarers.

'Barbaric' conditions on tanker

A Liberian-flagged chemical tanker was detained in Australia last month after crew members complained of 'barbaric' working conditions onboard.

The 46,733dwt Tintomara was held by the Australian Maritime Safety Authority (AMSA) after Filipino and Bangladeshi crew members filed allegations of a culture of bullying by senior officers, excessive working hours and non-payment of overtime.

AMSA allowed the vessel to leave port after the company replaced the master and chief officer, agreed to increase wages and reduce working hours, and to promise that none of the crew would be punished or further intimidated in response to their complaints. **()** Pilot killed: authorities in Lisbon launched an investigation last month after port pilot Barra Miguel Conceição died while disembarking from the Hong Kong-flagged boxship Singapore Express in Cascais Bay. Rescue efforts had been hampered by stormy weather conditions, port officials said.

Greek record: the number of Greek seafarers in employment has hit the highest level for almost 20 years. A report released last month shows a 12% increase in Greek seafarers serving on nationally-controlled vessels last year. Cadet numbers increased by 7.7% over the year, with 56 on Greek-flagged ships.

Hold deaths: an investigation has been launched after four port workers and a paramedic died onboard the Indonesian-flagged aggregates carrier Sumiei in the port of Banjarmasin, Kalimantan, last month. The men died in a cargo hold on the 1,388gt vessel, which had been carrying a cargo of palm kernels.

Green aid: the European Investment Bank and the Dutch financial institution ING have signed an agreement to provide up to €300m support for green innovation projects in the European shipping market, such as low-carbon retrofitting of ships or developing new low emissions vessels.

Danish growth: Danish

shipowners have unveiled a plan to expand the country's merchant fleet by 10% over the next three years. They also aim to deliver a matching increase in the number of seafarer jobs on the back of improved net salary arrangements for seagoing staff.

News in brief

Compensation case:

three Norwegian maritime unions have taken legal action against the shipping company GC Rieber and the crewing firm OSM seeking compensation for seafarers who, they argue, were unfairly dismissed. Terje Hernes, a lawyer for the NSOF officers' union, said: 'If the judgment goes in favour of GC Rieber, that they can shut down their own crewing company and lay everyone off in order to replace them with cheap foreign labour, then in reality Norwegian seafarers will be left unprotected.'

Asbestos alarm: French

seafaring unions have urged the containership company CMA CGM to check all of its fleet for asbestos after the substance was discovered on nine of the company's French-flagged vessels recently. The unions are also calling for extensive medical checks to be carried out on all seafarers who served on the ships where asbestos was found.

Positive call: negative

images are scaring young people away from the maritime industry, a Danish conference heard. Delegates at the meeting called for more to be done to portray the positive sides of shipping, and for closer cooperation within the industry to recruit and retain a new generation of seafarers.

Acid deaths: Italian seafaring unions have criticised safety standards after an inquiry concluded that three officers died onboard the passengership San Salvino in November 2016 as a result of inhaling sulphuric acid while working on the vessel's bilges in the port of Messina.

AUTOMATION

CLASS APPROVAL FOR SMART SHIP

The classification society Lloyd's Register (LR) has been involved in the approval process for China's first 'smart ship': the 38,000dwt bulk carrier Great Intelligence, pictured below.

LR presented its cyber-enabled ship (CES) descriptive notes to the vessel, recognising the safety measures in place to reduce risks arising from the smart systems onboard. These include the use of intelligent technologies, such as machine learning, and the integration of data



SEAFARER WELFARE

Nautilus/ITF inspector Tommy Molloy has raised concerns over 'a cycle of abuse' affecting seafarers onboard ships managed by Seaways Maritime International.

ITF inspectors have recovered more than US\$600,000 in owed wages for crew members on four ships in the company's fleet, with Mr Molloy twice called in to assist seafarers onboard the Marshall Islands-flagged bulk carrier Toba after it was detained in the port of Liverpool in April.

He also helped crew onboard another vessel, Ben Nevis, in October following similar complaints of outstanding wages.

ITF inspectors in Japan, the US and Brazil had to deal with unpaid wages claims on two more Seaways Maritime International managed vessels – Olivia and Ben Rinnes.

All the ships were registered in the Marshall Islands and Mr Molloy said he had alerted the flag state authorities to a repeated pattern of owed wages, as well as problems with repatriation and food supplies.

Now, he said, enough is enough. 'There seems to be a general acceptance that they don't have to pay their crews monthly, as required, or repatriate them on time. As long as the vessels can be detained, and owed wages and repatriation secured, the ships can be released to continue on their way in the certain knowledge that the cycle will continue and they will be detained at some stage in the future. Personally, I don't think that's good enough.'

nautilusfederation.org 12 April 2018

from the ship's health management and energy efficiency management systems.

Developed by the China State Shipbuilding Corporation, Great Intelligence is installed with an 'intelligent navigation' system that collects and analyses a wide range of data to select optimised routes and alert the crew to hidden dangers in advance.

China Classification Society vicepresident Sun Feng said: 'It shows that China has taken the lead in merchant ship design and construction. The smart ship has also laid solid foundations for unmanned ship development.'

CONSULTATION US UNION IN CBA BATTLE

The US Masters Mates & Pilots union (MM&P) has welcomed a decision by the National Labour Relations Board (NLRB) to take action against a shipping company for failing to properly consult over living standards onboard two new containerships.

The federal agency has upheld a complaint from the MM&P about the way in which the Pasha Group had not provided the union with documents to review before the start of construction to ensure that the ships comply with the standards set out in the collective bargaining agreement.

The two LNG-powered vessels are due to be delivered in 2020 and will operate on a route between California and Hawaii. The NLRB is seeking an order to compel Pasha to turn over the relevant documents and to bargain in good faith with MM&P.

'We are pleased with the NLRB's decision to prosecute Pasha,' said MM&P president Captain Donald Marcus. 'We will not hesitate to take any and all legal action necessary to vindicate the hard-fought contractual rights of MM&P members.'



FINNISH FUEL FACILITIES

DUTCH SHIP LAUNCHES LNG TERMINAL

The Dutch-flagged vessel Coral Express is pictured above as it unloaded the first shipment of LNG to the Tornio Manga receiving terminal in northern Finland at the end of November. The 15,000 cu m delivery marked the commissioning stage of the terminal, built under a turnkey contract by the technology group Wärtsilä, which will provide clean energy for industries in the region as well as bunkering facilities for LNG-fuelled ships — including the world's first LNG icebreaker, Polaris.

CRIMINALISATION

PIRACY SHIP CREW ARE FREED

Nautilus International has welcomed the acquittal and release of the 35 seafarers and security guards from the Seaman Guard Ohio support vessel who had been held in India for over four years on charges of possessing illegal firearms.

The Sierra Leone-registered ship was detained by the Indian authorities in October 2013 after it entered the country's territorial waters for bunkering. Police accused the crew, including six British security guards, of carrying unregistered weapons and making an illicit money transfer for the bunkers, and they were sentenced to five years' imprisonment.

The charges were initially quashed when the men argued successfully that the weapons were lawfully held for anti-piracy purposes and their paperwork was in order. But the case went to another court and they were sentenced to five years in jail.

'I am delighted that justice has finally prevailed and these men can return home to their families and put these dubious legal proceedings behind them,' said general secretary Mark Dickinson.

The International Transport Workers' Federation funded the appeal on behalf of the crew. ITF seafarers' section chair David Heindel commented: 'At last there is some form of justice, even if it cannot restore to the men the time lost since their arrest in 2013.

'Unfortunately, one glaring injustice remains: the scandal of AdvanFort getting off scot free, having washed its hands of its employees. They took the money, they sauntered off, pockets bulging. It is nothing short of shameful that our justice system allows them to get away with this. But as we have witnessed over and over, this is the flag of convenience system that has been created!'

The Mission to Seafarers, which provided extensive support to the ship's crew throughout their ordeal, also welcomed the ruling. Ben Bailey, director of advocacy, commented: 'The case of the Seaman Guard Ohio highlights once again the issue that millions of merchant seafarers often face when carrying out their everyday jobs. The criminalisation of seafarers remains a constant threat to those who are responsible for transporting over 90% of world trade.'

The Mission provided and administered a legal fund to fight the men's case, and also paid for medical treatment for the Ukrainian master's terminal illness in partnership with the ITF Seafarers' Trust. Maersk reflags: German seafaring unions have expressed concern about potential job losses after Maersk Line followed its €3.7bn acquisition of the containership operator Hamburg Süd last month by confirming plans to switch some of the 47-vessel fleet from the German flag to the Danish and Singapore ship registers.

Collision charges: the master of the South Korean bunker tanker Myeongjin-15 was charged with accidental homicide last month after his ship collided with a fishing boat near the port of Incheon, causing 15 deaths. Prosecutors said the captain had failed to make a proper risk assessment and a rating had been accused of failure to keep a proper lookout.

Chittagong concern: the

London P&I Club has issued an alert to ships visiting the Bangladeshi port of Chittagong, claiming that it has become 'an international hot-spot for anchordragging incidents'. It urged seafarers to be vigilant in the area, stressing the risks of congestion, strong prevailing currents and poor holding ground.

Danish attack: Denmark's Seamen's Union attacked European Union ministers for failing to stop social dumping. It said amendments to the directive on the posting of workers will fail to tackle the problems posed by the import of cheap labour.

Training downgrade: the

French officers' union FOMM-CGT has criticised the country's prime minister for suggesting that the two smaller sites of the national officer training academy, ENSM, should be downgraded to save money.

Officer killed: an investigation was launched last month after a Filipino deck officer died as a result of being crushed by a closing hatch onboard the Dutch-flagged general cargo ship Lady Christina in the port of Rauma, Finland.

INTERNATIONAL

In brief

Canadian code: Canada has introduced new Arctic shipping regulations, which incorporate the IMO's Polar Code into domestic legislation. The rules form part of Canada's C\$1.5bn Ocean Protection Plan, which aims to enhance safety through such measures as improved vessel traffic services, 'modern' charting in key areas, and increased resources for dealing with maritime emergencies.

Flag freeze: Tanzania's

president John Magufuli has ordered a temporary ban on the registration of foreign ships following the recent arrest of five Tanzanian-flagged ships carrying drugs and weapons. He also ordered an investigation into the 470 vessels currently on the country's register to determine whether they are obeying rules.

Dredger demand: the

French maritime union SMN has called for investment in a new dredger to operate in the ports of Calais, Boulogne and Dunkirk. The vessel would create 30 seafaring jobs and replace foreign-flagged dredgers that have operated along the Channel coast since the Dunkirk-based René-Gilbert was withdrawn in 2006.

Brittany warned: the

western France branch of the seafarers' union CGT has warned of possible industrial action as a result of Brittany Ferries' decision to charter a Cyprus-flagged ferry for a new service linking Ireland, France and Spain.

Fleet value: Greek owners have the most valuable shipping fleet, worth almost US\$100bn, according to a new report from VesselsValue. Japan's fleet is in second place, at just over \$89bn.



Abandoned in the UAE: the crew of the Aegean Princess Image: ITF

FRANCE

Union hits out as 'rustbucket' tug hits trouble

A French maritime union has questioned why a 'floating rustbucket' which had to be rescued after losing steerage in the Bay of Biscay last month had been allowed to sail from the Netherlands to Italy just a few weeks after being detained in the UK with a long list of defects.

The western France CGT union said it was disturbed that the 44-year-old tug Nas Pathfinder had sparked a major search and rescue operation when it ran into problems while towing another vessel – Puma, formerly the United Towing vessel Yorkshireman – some 195nm SW of the port of Brest.

French authorities sent two emergency towing vessels and a surveillance aircraft to the scene, and a Spanish ETV managed to take the tug and its crew of seven Polish seafarers to safety.

The Panama-flagged Nas Pathfinder had been detained for nine days in the UK during January after being towed to safety by Dover Harbour Board when it encountered propulsion problems in the Dover Straits Separation Scheme. A subsequent port state control inspection found 23 deficiencies, including hull cracking, inoperable emergency systems, and problems with the main engine and life-saving appliances.

The CGT praised the successful cooperation between the French and Spanish authorities but said it was concerned that neither the Netherlands nor the UK had alerted France that the tow was passing through waters in line with the Basel Convention on the control of transboundary movements of hazardous wastes. ()

SEAFARER WELFARE

The International Transport Workers' Federation (ITF) has helped to secure the repatriation of 11 crew from a Panamanian-flagged ship which had been abandoned in the United Arab Emirates for more than 17 months.

The seafarers – from India and Myanmar – had been stranded on the 1,116gt Aegean Princess in the port of Ajman. They returned home last month after the ITF worked with the UAE Federal Transport Authority and the flag state to progress their case.

ITF inspector Mohamed Arrachedi said he was pleased to have resolved a 'difficult' incident. 'But this is not the end of this sad story,' he added. 'The seafarers are owed wages going back to 2015, totalling over US\$916,000. There is never an excuse for seafarers to be abandoned like this. It is a scourge that has to stop, and it has to stop now.'

INDIA

ISWAN warns on agencies

The International Seafarers' Welfare and Assistance Network (ISWAN) has launched a campaign to discourage Indian seafarers from signing up with crewing agencies which have not registered with the country's Directorate General of Shipping (DGS).

The initiative follows a series of incidents in which Indian crews recruited through unregistered agencies have been abandoned overseas and left with unpaid wages. Others have found that their seatime had not been officially recognised as counting towards their higher grade qualifications.

The ISWAN campaign – which is backed by Indian unions and owners – aims to raise awareness of the risks of getting jobs through unregistered agencies, pointing out that some seafarers who have done so have ended up in prison as a result of being caught serving on ships with illegal cargoes.



UNION FEARS OVER GAS TANKER JOBS

The French officers' union Fomm-CGT has expressed concern that oil major Total has given no guarantees over jobs following its take-over of the Gazocéan gas tanker operation. Gazocéan employs 66 French officers on its five vessels, and Fomm-CGT General secretary Jean-Philippe Chateil has called for clear guarantees from Total that employment levels and working conditions will not change for three years.

DENMARK

OWNERS PLEDGE TO SWITCH SHIPS TO DIS IN RESPONSE TO STRATEGY PLANS

Danish unions have warmly welcomed the government's new maritime growth strategy, which has a raft of measures designed to cut red tape and boost recruitment, education and training, and framework conditions.

Ole Philipsen, head of the seafarers' union Metal Maritime/CO-Søfart, said it was 'hard to be negative' and called on the government to get things going as soon as possible. He said the only areas of concern were the funding of bachelor degrees and training places.

The 36 new initiatives stem from the recommendations put forward by a governmentappointed working group last year. Mr Philipsen said it was notable that the proposals compare Denmark with its neighbouring countries rather than Singapore and Malta (as was previously the case) and talk of a 'quality flag' and 'quality shipping'.

He also welcomed a decision to create a special section of the DIS international register for the offshore industry, with priority for Danish seafaring jobs.

The Danish government has proposed to cut registration fees for ships switching to DIS, and business minister Brian Mikkelsen said he regarded Maersk's intention to put several new vessels under the Danish flag as 'the first concrete proof' that the register has been made more competitive. J Lauritzen has also chosen to return two gas tankers to DIS and CEO Mads Peter Zacho said the flag is now almost as competitive as Singapore, Malta and the Isle of Man.

NORWAY

International register warning

Norwegian maritime unions have warned that up to 685 jobs could be lost if the ferry company Color Line is allowed to switch two of its ships to the NIS international register.

They have attracted support from other Nordic unions, who fear Color Line's move could be followed by companies such as DFDS and Fjordline – sparking increased pressure to bring in low-cost foreign crews. 'No one would remain still and see their competitors get better conditions,' said Ronny Øksnes, of the Norwegian Seamen's Union. 'It would end with thousands of Norwegian seafarers being replaced with cheaper international seamen.'

Unions argue that Color Line would save barely NOK6m (€620,000) a year by bringing in foreign crews. **()** Philippines alert: a union leader in the Philippines has warned that the jobs of up to 80,000 of the country's seafarers could be at risk as a result of a lack of leadership at the Maritime Industry Authority. Gaudencio Morales, president of the Integrated Seafarers of the Philippines, said a three-month 'power vacuum' could threaten the country's ability to pass European Maritime Safety Agency checks on compliance with training and certification standards.

Norway boom: the

Norwegian merchant fleet has increased to its highest level in a decade, with more than 600 ships now on its international register (NIS) – up from 522 in 2014. Government ministers put the increase down to policy changes introduced in 2016, which relaxed trade area restrictions on NISflagged ships and extended tax and social security concessions for Norwegian seafarers.

Port plea: the Far Eastern and Baltic branches of the Russian Seafarers' Union are calling for simpler procedures to enable officials to meet members in the country's ports. Union officials recently had to apply for separate entry permits for the 20 terminals at the port of Nakhodka to visit ships and meet members, sometimes waiting several days for them to be granted.

Busy coastguard: the

French coastguard has reported an increase in Channel and North Sea call-outs last year. It took part in 1,299 operations involving assistance to ships, up from 1,219 in 2016, and responded to 75 pollution incidents, compared with 53 in 2016.



LISTEN TO THE PEOPLE

The 21 unions in the Nautilus Federation have come together to give a voice to seafarers in the debate over automated shipping. **Andrew Linington** reports...

T

he potential for 'smart' ships to improve working lives and safety in the maritime

industry could be wasted if the human factor is ignored in the drive to introduce new technologies, a new report from the Nautilus Federation of unions has warned.

Drawing on a survey of almost 1,000 maritime professionals from more than a dozen different countries, the report argues that important social and human issues have so far been neglected by manufacturers and authorities as the introduction of autonomous ships comes closer.

The Nautilus Federation – which is composed of 21 unions in 16 countries, together representing more than 90,000 maritime professionals – conducted the research in an attempt to shift attention to the impact of 'the fourth industrial revolution' upon seafarers.

The report points out that some major maritime nations and leading technology equipment manufacturers are investing huge amounts of time, energy and money into researching and developing products and systems to enable the deployment of autonomous or remote-controlled vessels. The first fully autonomous ship is expected to be brought into commercial service by 2020, and the Federation argues that it is essential that the human perspective on these developments is taken into consideration before radical changes to shipping operations take place.



of maritime professionals see automation as a threat to their jobs Nautilus International general secretary Mark Dickinson commented: 'Properly introduced, automation and digital technologies could transform shipping in a positive way – eliminating some dirty and dangerous tasks, cutting paperwork and bureaucracy, and generating significant productivity gains. Managed poorly, however, it could undermine safety and dangerously erode the essential base of maritime skills, knowledge and experience.'

Mr Dickinson said he hoped the survey would 'help to shape a future in which new technologies are used not simply as a crude substitute for seafarers, but as a tool to improve the safety and efficiency of the shipping industry and the working lives of all within it'.

Key findings in the survey include:

84% of maritime professionals see automation as a threat to their jobs
more than 85% consider that unmanned, remotely-controlled ships present a threat to safety at sea

 83% consider that new technologies have the potential to improve the quality of life at sea and more than 60% believe they have the potential to improve safety 80% believe that radical changes in training and certification are required as a result of the rapid advances in shipping technology more than 60% believe seafaring unions should resist automation • fewer than 40% believe that commercially viable unmanned ships will be in widespread service within the next 20 years almost 90% believe that shipowners will only introduce autonomous ships if they are cheaper than using seafarers

Respondents said the introduction of autonomous shipping operations was most likely to be made in deepsea services and least likely within ports and pilotage areas.

Many questioned the economic viability of autonomous ships pointing out that crew costs have been driven down to very low levels through increased recruitment of seafarers from low-cost labour supplying countries and through sustained reductions in crewing levels. Other obstacles to the adoption of autonomous ships were felt to be cyber-security, the reliability of communications, legal and liability issues, software quality, risk assessment and public acceptance, opposition from seafarers and their unions, regulatory issues, and training and reskilling.

The survey revealed significant concerns about the safety of autonomous or remotely-controlled ships, such as pump and pipe failures leading to unpredictable and complex chains of failures. Respondents warned of:

- problems in conducting routine and corrective maintenance
- equipment and system failures
- redundancy and reliability of
- shipboard equipment • software bugs
- IT and communication problems • sensor failures as a result of heat and vibration
- piracy and cyber attacks

cargo security

unpredictable sea conditions
on-the-spot decision-making in dynamic environments
the relationship between autonomous ships and conventional vessels during the transition period

However, the survey also showed that very few maritime professionals are completely opposed to automation at sea. A substantial proportion consider that new technologies could improve safety and working conditions by reducing workloads, easing administrative burdens, improving predictive and preventive maintenance, and providing improved standards of information to officers.

There was significant support for a more 'hybrid' approach to operations – in which 'smart' systems work in a supporting capacity alongside trained seafarers who remain in control.

There was also strong support for improved training to ensure that seafarers are able to take full advantage of the benefits that new technology could bring, and to ensure the safe operation of onboard electronic and IT systems. Respondents expressed mixed

views over the development of

Auto pilot scheme

French offshore support vessel operator Bourbon has launched a pilot project to use advanced automation technologies with the aim of reducing crew levels.

The company – which operates more than 500 ships – has entered into a strategic partnership with the classification society Bureau Veritas to develop and deploy a number of new automation



and real-time monitoring applications within the fleet.

The pilot scheme was implemented onboard the 3,147gt supply vessel Bourbon Explorer 508, which is operating off Trinidad. Developed in conjunction with Konsberg Maritime, the project involves the collection of data from the DP system to 'drive the development of novel decision-making and verification applications for both offshore crew and onshore support teams'.

Bourbon said the pilot forms part of its 'smart shipping' programme to provide realtime advisory tools for bridge operators and remote support for onshore teams. The company said it is aiming to streamline onboard organisation, leading to a potential reduction in manning, and to cut fuel and DP maintenance costs. shore-based fleet operations centres. There were many calls for the International Maritime Organisation to urgently develop training and operating standards for personnel working in such facilities.

Many of the survey participants also called for the shipping industry to pay appropriate attention to the experiences of other industries – such as aviation – which have already embraced high levels of automation and IT.

Much greater focus should be placed on the way in which seafarers will be expected to interact with new technology, the report adds, warning that accidents linked to Electronic Chart Display & Information Systems (ECDIS) demonstrate the dangers presented by inadequate training and poor ergonomics.

The report says seafarers should be given a proper say in the introduction of new technologies - at shipboard, company and regulatory levels. There should be a strong commitment to finding ways to use new technologies to improve the working lives of seafarers by eliminating dirty, dangerous or tedious tasks, and by ending excessive hours and fatigue - as well as enabling earlier retirement for those who want it. Retraining and upskilling programmes should be introduced for those who face redundancy as a result of technological change, it adds.

Work should also be carried out to examine ways in which new technology can be used to enhance maritime skills and to create new roles in operational oversight and control, analysis, and research and development.

'People are – and will continue to be – critical to the safe and efficient operation of the shipping industry,' the report concludes. 'Maritime skills and experience should remain an essential component of the way in which shipping works, regardless of the scale of technological change.'

83%

that new technologies

have the

potential to

improve the

quality of life

at sea and

more than

60% believe they have the

potential to

improve safety

OUR SURVEY GAIN SA 84%

Following the analysis on pages 32-33, here's a breakdown of the key figures from the Nautilus Federation survey on automation

1. WILL COMMERCIALLY VIABLE UNMANNED/ **REMOTELY-CONTROLLED SHIPS BE IN SERVICE BY** 2020?

International

trans-ocean

trade

Harbours

pilotage

and

areas

2. IF AUTOMATION IS INEVITABLE, WHERE IS IT **MOST LIKELY TO** HAPPEN?

20%

Inland

and/or

waterways

coastal trade

3. DO YOU CONSIDER AUTOMATION TO BE A THREAT TO SEAFARING JOBS?

> 33% Yes

Yes

16%

4. ARE NEW TECHNOLOGIES THAT REPLACE SEAFARERS **BENEFICIAL TO SHIPPING?**

> 5. DO YOU CONSIDER UNMANNED **REMOTELY-CONTROLLED SHIPS TO BE A THREAT TO SAFETY AT SEA?**

> > Yes

No

15%

No

6. IF UNMANNED REMOTELY CONTROLLED SHIPS ARE A THREAT TO SAFETY, WHERE DO THEY POSE THE GREATEST DANGER?

59%	Everywhere	
19%	Offshore services	
12%	International waters	
38%	Coastal waters; in ferries	cluding
39%	Harbours and pilotage areas	

7. IS AN INCREASED LEVEL OF AUTOMATION AND THE REMOVAL OF SEAFARERS A POSITIVE FACTOR FOR IMPROVED SAFETY?

82%

8. WHAT LEVEL OF AUTONOMY PROVIDES THE OPTIMUM LEVEL OF SAFETY FOR FUTURE SHIPS? SELECT FROM THE FOLLOWING AUTONOMY LEVELS (AL) CURRENTLY RECOGNISED BY LLOYD'S.

