

Inséré 25/04/22 NIEUWS NOUVELLES Enlevé 25/05/22

Jan De Nul launched its Next Generation Offshore Wind Installation Vessel Les Alizés

An important milestone is reached in the construction of LES ALIZES, a Next-Gen floating offshore installation vessel for offshore renewables and decommissioning. Jan De Nul launched its Offshore Installation Vessel LES ALIZES at the CMHI Haimen shipyard in China. This vessel will be the largest Heavy Lift Vessel in Jan De Nul's fleet, able to install XXL offshore wind components, in floating conditions and with ultra-low emissions. The launch started on 2nd January by flooding the dry dock in which Les Alizés was built. Once afloat, LES ALIZES was moored alongside the adjacent quay wall., the official launching ceremony took place at the CMHI Haimen shipyard, in the presence of the shipyard management and Jan De Nul Group representatives. The final phase of the vessel's construction can now begin, including sea trials. LES ALIZES is due for delivery in H2 2022 in good time for her first assignment in Germany for the construction of Gode Wind 3 and Borkum Riffgrund 3 Offshore Wind Farms, transporting and installing 107 monopile foundations for the offshore wind major Ørsted.

Philippe Hutse, Director Offshore Division at Jan De Nul Group: "The construction of our offshore floating installation vessel LES ALIZES is well on track. We can look forward to delivery later this year, so that we can continue to build the future of offshore renewable energy. Together with our Offshore Jack-Up Installation Vessel VOLTAIRE, which is also under construction in China, we will have the perfect set of offshore installation vessels that will be able to install current and future generations of offshore wind farms. This is how we offer our customers the most efficient installation solutions and results."

An innovative design ready for future challenges

LES ALIZES is equipped with a crane having a lifting capacity of 5,000 tons and equally impressive lifting heights. Following her order at the end of 2019, the design of LES ALIZES has been further fine-tuned. The vessel is taking shape thanks to the investments in innovative mission equipment, enabling Jan De Nul to offer solutions for the next generation offshore wind installation challenges while improving safety and efficiency:

- A highly innovative crane with Universal Quick Connector (UQC): this crane will be among the largest in its class. The crane will utilize a Universal Quick Connector (UQC), developed by Huisman, and leveraging the expertise of Jan De Nul's operational and engineering teams. The result is a ground-breaking innovative UQC, that will deliver a major step change in safer offshore lifting activities.

- An innovative motion-compensated pile gripper: the highly advanced electrical gripper, with an integrated guidance and survey system, will allow safe and efficient installation of next-generation monopiles with pin-point accuracy.

- A fully automated monopile handling system: the tailor-made system consists of a set of cradles, a skidding system and an upending hinge to handle and install XXL monopiles. It is ideally suited to work in challenging weather conditions and high sea states.

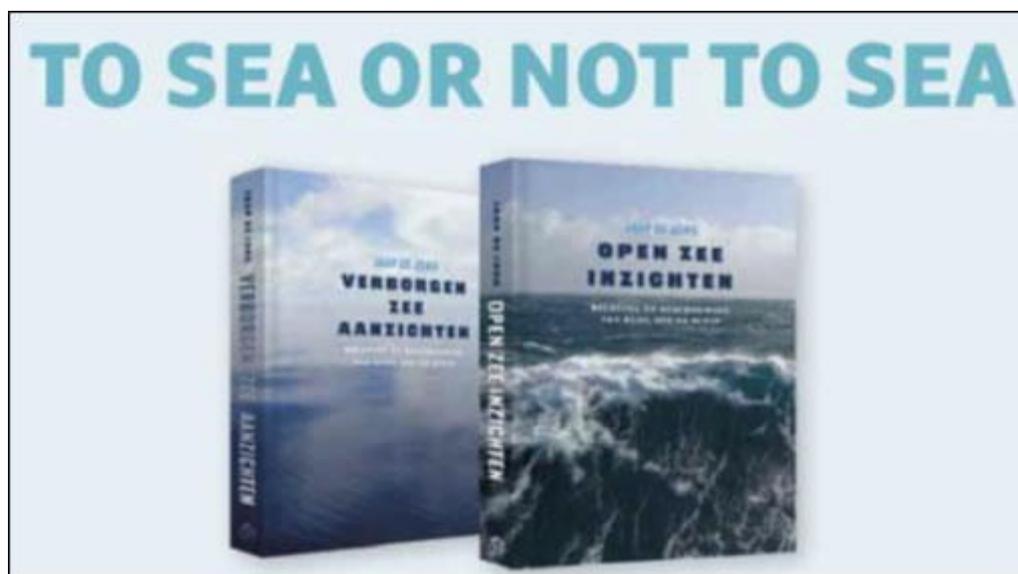
Jan Van De Velde, Head of Newbuilding Department at Jan De Nul Group: "It is our continued philosophy to focus on operational efficiency and improving safety as the main objectives. The Universal Quick Connector, the innovative Motion- Compensated Pile Gripper and the fully automated Monopile Installation System perfectly fit into our strategy of having no manual deck intervention during installation. We stay one step ahead in offering the renewables industry a safe and efficient one-stop-shop installation solution. «In order to reduce the vessel's CO2 emissions, the power plant on board is a hybrid setup.

The arrangement combines diesel-driven generators with battery and drive technology to optimize engine loading and to recover the potential energy returned from the heavy lift crane. To further reduce the carbon footprint of installation activities, the ultra-low emission vessel can run on second-generation biodiesel that reduces the fuel carbon footprint by up to 90%. As an ultra-low emission vessel LES ALIZES is equipped with a highly advanced dual exhaust filter system, removing up to 99% of nanoparticles from emissions using a diesel particulate filter (DPF) and reducing the NOx emissions and other pollutants by means of a selective catalytic reduction system (SCR) to levels in accordance with EU Stage V regulation. LES ALIZES and VOLTAIRE will be the first two seaworthy installation vessels in the world with extremely low emissions.

Inséré 27/04/21 BOEKEN LIVRES BOOKS Enlevé 27/05/22

“VERBORGEN ZEE AANZICHTEN”

BOEK BESPREKING door JAAP DE JON :



Het boek **VERBORGEN ZEE AANZICHTEN** van Jaap de Jong biedt een zee aan informatie, waarin verscheidene thema's als grote rivieren samenvloeien: zeerecht, de kleur van de zee, navigatie, scheepstypen, havensteden, zeevogels, kustvormen en kwelders. We vergezellen de schrijver op zijn reizen, in ruimte en tijd, over oceanen, zeeën en rivieren en leren gaandeweg meer over zijn ontdekkingen en zijn motieven om deze in kaart te brengen.

Want het boek krijgt steeds meer het karakter van een ontdekkingsreis. Zo ontdekken we samen met hem, dat de reis van Vietnam naar het Panamakanaal korter is via 'de noordelijke route' langs Japan, Alaska en de Amerikaanse westkust, dan via de 'rechtstreekse' route via Hawaï. Dat de Chinese aanspraken op de Zuid-Chinese zee in beton gegoten worden, maar in werkelijkheid op drijfzand berusten. En, nog een voorbeeld, hoe ook tussen Azië en Australië mensensmokkelaars actief zijn, die zodra ze de kans zien het zinkende schip verlaten en de vluchtelingen aan hun lot overlaten. In zekere zin gaan de vele reizen gaandeweg het leven van de schrijver zélf afbeelden. We zien hoe hij steeds meer leert over de verborgen aspecten van de zee en van het leven zelf, op zee en aan de wal. Het boek eindigt met een lichte heimwee. De moderne communicatie- en navigatiemiddelen maken het varen steeds minder avontuurlijk en verbeeldingrijk. En juist dát, is wat hem steeds bewogen heeft. Het boek is door de vele prachtige illustraties een machtig kijk-, lees- en bladerboek. Een waar mer à boire. De een zal het niet weg kunnen

leggen, de ander zal er zo nu en dan een diepe teug van nemen. Het is een jongens[- en meisjes]boek voor volwassenen.

De auteur, **Jaap de Jong** [Balk, 1953], woont in Harlingen en is zee kapitein en schrijver. Voor het bekende scheepsbouwbedrijf van Kommer Damen in Gorinchem brengt hij nieuwbouwschepen van werf naar haven, waar ook ter wereld.

Verborgen Zee Aanzichten (2017),
hardcover, 296 p. formaat 21 x 27, ISBN 978-949-205-232-2

Open Zee Inzichten (2020),
hardcover, 120 p. formaat 21 x 27, ISBN 978-94-92052-66-7
Beide delen samen €25,00, in cassette € 35,00
Uitgeverij Wijdemeer www.wijdemeer.nl wijdemeer.nl@wijdemeer.nl

Inséré 27/04/22 DOSSIER Enlevé 27/05/22

Where oil rigs go to die

When a drilling platform is scheduled for destruction, it must go on a thousand-mile final journey to the breaker's yard. As one rig proved when it crashed on to the rocks of a remote Scottish island, this is always a risky business

by Tom Lamont

It was night, stormy, and the oil rig Transocean Winner was somewhere in the North Atlantic on 7 August 2016 when her tow-line broke. No crew members were on board. The rig was being dragged by a tugboat called Forward, the tethered vessels charting a course out of Norway that was meant to take them on a month-long journey to Malta. Within the offices of Transocean Ltd, the oil-exploration company that owned the rig, such a journey might have been described with corporate seemliness as an "end-of-life voyage"; but in the saltier language heard offshore, the rig was "going for fucking razorblades" – for scrap, to be dismantled in a shipbreaking yard east of Malta. In that Atlantic storm, several thousand miles from her intended destination, Winner floated free.

The 33-year-old rig had never moved with so little constraint. Winner was huge – 17,000 tonnes, like an elevated Trafalgar Square, complete with a middle derrick as tall as Nelson's Column, her four legs the shape of castle keeps; all this was borne up in the water on a pair of barge-sized pontoons – and its positioning had always been precisely controlled. While moored, she was held in place by eight heavy anchors. At other times, she was sailed with a pilot at the helm as if she were any other ship. When contracted to drill in the North Sea, as she had been since the 1980s, boring into the bedrock for hidden reservoirs of oil, Winner's anchors and underwater propellers worked together with her on-board computers to "dynamically position" her – that is, keep her very still. The men and women who formed Winner's crew – drillers and engineers and geologists and divers and cleaners and cooks, most of them Norwegian – imagined this rig to have a character that would resist such checks. They nicknamed her *Svanen*, or Swan, because to them she was both elegant and unyielding. Scheduled as she was for destruction, Winner could not have chosen a better moment to bolt.

The master on the tugboat Forward radioed for help. Through a series of exchanges with Transocean, as well as with the British coastguard and Forward's owners, the Rotterdam-based ALP Maritime, the master explained his situation. Both tugboat and rig had been caught in heavy weather while circumnavigating the Hebrides, sailing a mile and a half off

the Scottish islands. It turned into the worst summer storm in the region for years, with winds of 40 knots and waves 10 metres high. Throughout the afternoon of 7 August, Forward and Winner were tossed on a course running parallel with the coast of Lewis, one of the outermost Hebridean islands. For a time it seemed they would be sent on by, still fettered to each other, still Mediterranean-bound. But in the early evening the wind changed direction, and Forward and Winner – or more accurately, Winner and Forward, given that the rig was now acting as a huge metal sail and comfortably tugging her own tugboat – were forced landward. It was around 4am when the master radioed to confirm that the tow-line had snapped. Winner had, for all of her life, been painted bright orange. The colour had become chipped and rust-stained over time, but was still vivid in daylight, visible for miles. In the storm, the rig disappeared completely. Radar data from those early-morning hours showed Forward moving back and forth in the water off Lewis, as if retracing steps for something misplaced. It was agreed between Transocean, ALP, the coastguard and other emergency authorities that Winner was irretrievable. Everybody would wait until sunrise, and see.

Stavanger

The world has a problem with its oil rigs. There are too many of them, and for the first time since the earliest manufacture of seaborne drilling platforms 50 or 60 years ago, decisions are being made about how and where to get rid of them in number. That there should be a sudden surplus is vexing for those invested in undersea drilling: as recently as 2010 the rigs were thought too few. Back then, had an oil company such as Shell or BP or Marathon wanted to dig down and discover what was lying beneath a particular patch of sea, it wasn't unusual for them to wait as long as a year until an exploration company such as Transocean or Diamond or Ensco had a rig available to lease to them. It was a time of undersupply. Dozens of new rigs were commissioned, and worldwide orders tripled between 2010 and 2011. But oil rigs take two or three years to build, and by the time these were ready for use, the price of oil had declined sharply, and with it the industry's hunger to prospect – thus the oversupply. Rigs without contracts to drill were either "cold-stacked" (anchored without crew) to wait for a market recovery, or sold for demolition. More than 40 oil rigs were waved off on end-of-life voyages in 2015, according to data gathered by a Brussels-based maritime NGO called Shipbreaking Platform; up from a single dispensed-with rig, so far as the NGO knew, in 2014.

It was a hasty and disordered rebalancing of the global fleet, and not all the decisions made were sensible. In the spring of 2016, for instance, at about the time Transocean was considering whether or not to decommission Winner, its drilling rival Ensco sent away two rigs that were relatively new: built in 2004, and meant to bear 30 or 40 years of graft, but hurriedly euthanised after 12. Winner, by comparison, had lived long and busily. She was launched in 1983, and in the decades since had bobbed through market downturns and upturns, through winter hurricanes and underwater blowouts, and at least two on-board deaths. For the most part, Winner's 33 years at sea had been characterised by day after day of patient, repetitive work – the stuff that gives offshore life its rhythm and, for many, its special comfort. Drill supervisor André Arctander, a tanned greybeard from Stavanger in Norway, calculated that he had spent a third of his life on this rig. The colour of his boilersuit had changed, Arctander said, in accordance with the branding requirements of drilling clients, but he retained throughout a deeper loyalty to Winner and her regular crew "that went beyond corporate logos". He spoke of getting so in tune with the rig during his fortnight-long stints on board that he could fall asleep in his cabin and wake up knowing half of what had happened while he was under, just from having felt the changes in Winner's vibrations and having heard her machine-purrs.

In spring 2016, as Winner was nearing the end of an 11-month contract with Marathon to drill in the Norwegian sector of the North Sea, rumours of her possible scrapping spread around the crew. In the rig's "smoko" rooms and coffee shops, they discussed the contradiction that underpinned their industry: while the price of oil might move up and down, shareholders in drilling companies tended to prefer numbers that moved in only one

direction. It was difficult and expensive to maintain a cold-stacked rig. Winner had herself been cold-stacked once, and the crew's first task after reboarding was to snap away the icicles in their cabins. Meanwhile, there were immediate returns to be made by selling for scrap. "It would be better to have long-term plans and a buffer of funds to use during hard times," Arctander thought. "But this is not how it works." In July, Winner's scrapping was confirmed. A Norwegian crane operator posted a message on the rig's Facebook page: "*Malta og spiker next.*" Loosely translated, he meant: "Malta next, then a furnace – somewhere."



The Transocean Winner drilling rig off the coast of the Isle of Lewis after it ran aground in severe weather conditions.

It is common for rigs on end-of-life voyages to be towed with their tracking systems switched off. On 3 August, **Winner** sent out a final blip from a fjord in southern Norway, near Stavanger, and then stopped sending a signal. The tugboat Forward then took her out into the North Sea. On 6 August, Winner entered the Atlantic, and the next day she was lost in the storm off the Hebrides. On 8 August, shortly before sunrise on the Isle of Lewis, the oil rig washed in with the tide.

Dalmore Bay

Her 17,000 tonnes came in on Dalmore Bay, one of the island's prettiest beaches, a quarter-mile crescent of bone-coloured sand and muscular swell that, on a normal Monday morning, could expect to be visited by dog-walkers, surfers, kayakers, seabirds, even dolphins. Back behind the sand, where the beach narrowed and formed an uneven track up to the coastal road, lay the gravestones of a hundred or so islanders. A fractional difference in the gusts and tides overnight, and the runaway Winner might have brought her great weight down on the resting place of one Malcolm MacCauley, whose grave was set closest to the water. As it was, the rig collided with the headland that defined Dalmore Bay's southern edge – a slope of marram grass busy with snails that rose to a boggy cliff and then fell away to rocks on the foreshore. Winner's pontoons scraped into the shallows and a strut of her crosswise steel snagged on a tall, tooth-shaped crag. The rig pitched to

the south, away from the beach, her derrick cutting obliquely across the sky and her helipad inclining at an angle that to the human eye read as almost apologetic. However terrific a noise this made nobody was around to hear it, bar the seabirds and snails. The police started to arrive around 7am, as did the first stunned residents.

Lewis is made of old, old rock. There is presumed to be Viking DNA coursing through the islanders, and it is a general trait of the community that its members be stoic and unhysterical, whatever difficulties – generally weather-borne – come this far north to trouble them. Perhaps there were some on Lewis that week who heard that an oil rig had struck and shrugged. But most who were mobile and even mildly curious put aside their habitual stoicism to make a trip to the beach and stare. "On Lewis?" said Don MacKay, a fisherman. "This was seismic."

When MacKay journeyed to Dalmore to see Winner, he was put in mind of a steel spider, poised on the shore as if plotting some sinister next move. Laura Carse, a surfer, felt it was like the time she returned home to find her house had been burgled. Not because Winner's presence struck her as violent, or a violation, "but because my brain could not quite manage the image". This was as if a church or a rollercoaster had suddenly manifested on the sand. Don MacKay said: "Yes. It took a wee bit of time to absorb the info."

Winner's name was painted on her forward side, the black-on-yellow letters so large as to be crisply distinguishable from the shore – a scale that would only start to make sense to onlookers when emergency salvage workers boarded the rig, and it could be seen that each letter was about three humans tall. The first salvage mission to Winner was made by coastguard helicopter. A team of six were lowered one by one by winch to the deck of the rig, and were removed again by helicopter that evening. By Winner's second day in Dalmore, the weather made any more such airborne trips impossible. For a week the rig simply stayed where she was, unoccupied, her weight against the rocks. When the salvors got back on board, they did so by boat, sailing close enough to hop on to a pontoon and scale one of the rig's legs using ropes. It was not easy to go back and forth from rig to shore this way, so the team sequestered cabins and stayed aboard. One of them reported that, because of Winner's tilt, her bunks were uncomfortable to sleep in, at least until they removed the cabin doors and propped them horizontally beneath the mattresses.

Tugboats and other support vessels now filled Dalmore Bay, waiting for the go-ahead to tow Winner off the rocks. Robotic diving units were sent underwater to collect images of the rig's pontoons. Both were badly damaged, one with a narrow triangular hole that was at least 10 metres from end to end, the metal drawn and furled at the base so that it resembled a heaved-open theatre curtain. Early visitors to Dalmore had reported a smell of fuel coming over the sands. Nobody in this part of the country could forget what had happened in the Shetlands in the early 1990s when a tanker, Braer, foundered in a storm off the islands' southern edge and disgorged many thousands of tonnes of crude oil into the water. There were fears of a similar spill from Winner, but the truth was that, although she was often referred to as an oil rig, Winner's real business was mud. During her decades at sea, Winner was generally a tunneller, commissioned to bore through layers of undersea rock and sludge, after which a purpose-built tanker would float in and slurp up any finds. It was estimated at the time of her grounding that Winner carried a few hundred tonnes of diesel fuel, kept in tanks in her pontoons. Some of this fuel had escaped through the tears in the pontoons. Salvors drained what remained into tanks on the surrounding support boats, and meanwhile concocted a plan to pump compressed air into the newly emptied pontoons. This would set Winner afloat again. She could then be towed off the headland on a high or rising tide, and dragged to a bay on the other side of Lewis, where it could be figured out how to make her properly seaworthy.

What had begun as the quiet removal of Winner from Norway – a journey scarcely noticed by anyone outside the oil business – was now a richly public event. Nothing quite like it had happened in the Hebrides since the 1940s, when the cargo ship Politician, abundantly loaded with bottled spirits, ran aground on the nearby island of Eriskay. The local response on that occasion – an outrageous carrying-away of the booze – inspired a novel and a

film, Whisky Galore. In the case of Winner, her plunder value existed in her bones – her predominantly steel frame – and it was residual value that would not be easily released; something to which Transocean could by now attest. It had in its fleet more rigs than any other drilling company – more than 70 in 2016 – and the earlier pruning of about a dozen of these vessels had been conducted with discretion. Now the sun was up on a fiasco. Dave Walls was one of the Transocean directors who flew to Lewis from the company's headquarters in Aberdeen. At a press conference on the island 11 days after the accident, Walls pledged that Winner would be recovered from the rocks and put her back on her journey east. "We will make right any damage," Walls said. Transocean later gave the Dalmore community £120,000 in reparations. A financial statement released by the oil company in November 2016 made clear the larger cost of the accident: at least \$21m (£16m). That month, on 21 November, Walls was asked at a parliamentary hearing about the circumstances leading up to Winner's nighttime escape. Why had the rig been pulled into a storm that was long forecast? Walls seemed to suggest that the master on the tugboat Forward had tried, in error, to outrun or outmuscle the Hebridean seas. (The Marine Accident Investigation Branch has been looking into the incident since the summer of 2016, and its report is expected later this year. In response to my request for comment, Transocean cited this ongoing investigation and declined to answer my questions about Winner. In a statement, Transocean added: "We will continue to meet our responsibilities arising out of this incident.")

On Lewis, in the aftermath of the grounding, there were historically unprecedented traffic jams on the single-track road to the beach. Access was now forbidden, and a policeman guarded the junction. Arriving on the island, I made enquiries about getting aboard Winner and was told, roughly speaking, that I had about as much chance of getting on the whisky-carrying Politician, which had been on the bottom of the sea for 70 years. A restriction zone around Winner took in land, sea and air, so that hikers were forbidden to walk the fringing coastal paths and fishermen were told to putter their boats at a distance. On the evening of 22 August, allowances were made for a seismic local event, and islanders were permitted back to their beach to watch Winner be towed away. Around a hundred people came to watch, a shuttle bus running them down the beach road in shifts. A tea station was set up by volunteers. Midges hummed about. At 9pm the sun went down behind the rig, quite spectacularly, and after that the tow-lines between Winner and her tugs visibly tautened. The underwater pontoons were filled with compressed air. A shout went up on the shore: "She's on the move!" There was a ripple of applause.

As she came off the rocks, "seemingly inch by inch", said Don MacKay, Winner continued to list very badly. She was towed north across the bay until hidden by a distant headland. There was another round of applause on the beach, then a polite rush for the first shuttle bus. MacKay was not sorry to see Winner go, he said, but like many of the islanders, he had become curious about the rig's fate and intended to follow her progress. Authorities had said they expected Winner to arrive on the eastern side of Lewis the next day, a Tuesday. But when MacKay checked that day, she had not yet appeared. He checked again early on Wednesday. Still no sign. The runaway rig had once more disappeared from public view.

Gothenburg

That Winner floated at all when she came off the rocks was the consequence of an old tragedy, half-forgotten by the summer of 2016, but rawly felt at the time of this rig's invention. In 1980, a North Sea rig called Alexander Kielland had been struck by savage winds that weakened one of its legs and, with lethal suddenness, caused it to list and capsize. Of 212 crew, only 89 survived. North Sea rigs, it was ruled by British and Scandinavian authorities, must be fit to withstand such winds, and worse. That year, at the Götaverken Arendal shipyard in Gothenburg, Sweden, an engineer called Hadar Liden sketched Winner's shape on paper with these instructions in mind. "If she lost a leg on the water," recalled Liden, who in the 1970s and 80s was Götaverken's chief of structural design, "even then she should be able to float." At his drawing board, Liden conceived a

rig that would remain buoyant in 100-knot winds, in 100-metre-high waves, even after being hit by, say, a fuel tanker. For improved stability, the new rig would be squatter, squarer and more symmetrical than the clumsily shaped, five-legged Kielland. Four-legged rigs had been built before, but were not then common. Inside Götaverken, which had built rigs to order but never before designed its own, Liden's creation was nicknamed "the Little Chair".

Götaverken wanted \$65m to build the rig for a client (about \$180m today), and a first order was placed in 1981 by a maritime firm in Oslo. Liden watched through his ninth-floor window at Götaverken headquarters, peering deep into the bed of the shipyard as a pair of 80m pontoons were constructed, each in a dry dock. Four circular stumps were built, each the size of pitched-over ferris wheels, added to in pie-quarter portions, to make the rig's legs. In 1982, the half-made rig was set afloat, and a multi-layered box of steel was craned into place to form the deck. Jutting struts, front and back, were strung with lifeboats. A 49m derrick was erected. By now the rig reached higher than Liden's ninth-floor window. By 1983 it was ready for delivery, and its owners in Oslo promptly chartered the rig for several years to Saga Petroleum, a Norwegian firm that assumed naming rights. In her early years, the rig was known as Treasure Saga. A picture of her, freshly orange and resplendent, made the cover of one industry magazine.

Here was a rig, wrote the trade press, "for the 90s". Liden and his colleagues expected their creation would last longer than that. In fact, the rig outlasted both the shipyard in which she was built (Götaverken closed in 1990) and the oil company she was first leased to (Saga was absorbed by a rival in 1999). Treasure Saga was bought by Transocean in 1998 and rechristened Transocean Winner. She was leased for months and years at a time on contracts to drill in North Sea oil fields, many of which had been given mythological names such as Asgard and Midgard, but which held in their depths somewhat more earthly riches. In 1969, a rig called Ocean Viking had been idly and unhelpfully prospecting in this region, when a worker named Stale Salvensen, down on the drill floor enjoying a sly cigarette, smelled the distinctive, sour scent of unprocessed crude. By the time a superior was summoned from his cabin, there was so much oil sloshing around Viking's lower deck that Salvensen's boss slipped and fell in his pyjamas. And thus, ingloriously, a continent got its oil industry. The North Sea has been profitably drilled ever since, with exploration rights shared between its bordering countries, Norway, Denmark and the United Kingdom. Winner achieved some fame, in 2010, for striking the year's biggest find, a reservoir in the Norwegian sector that yielded many hundreds of millions of barrels.

Hadar Liden had retired by then. He was living in Gothenburg when I called him at his home, in the autumn, not long after Winner's grounding. I asked the 88-year-old if he had thought about his rig at all, since seeing it off out of Götaverken, and he said: "Oh, always." Liden could recall in detail the proportion of high-tension steel that made up Winner's overall weight (48%), and the mill in Sweden this steel had come from (Oxelösund, on the Baltic Sea). He found it harder to grasp just how much life had been lived aboard his Little Chair over three decades – the birthday cakes and Christmases, the bingo games and barbecues. Every evening she spent on board in the 1980s and 90s, a geologist named Brit Riise Fredheim would take a walk around the rim of the upper deck, and afterwards climb the derrick, for the exercise and the view. Of watching North Sea sunsets from Winner's pinnacle, Fredheim said: "I felt like I owned the world." The oil rig had a gym, and one year they brought on board a running machine. The crew got a slow satellite internet service. "We watched movies and farted and laughed together," André Arctander said. He had been the rig's unofficial counsellor, reassuring colleagues when the isolation of offshore life got overwhelming. "Many times," said Arctander, "grown men came into my office and started to cry. My wife cannot believe this."

Liden was unaware of Winner's trials in Scotland: the storm, the grounding, and how, after lengthy relief work to tow the rig out of Dalmore Bay, Winner had seemed to vanish again, her reappearance after a 50-mile circumnavigation of Lewis dramatically delayed because of fears she would capsize. The rig eventually arrived in Broad Bay on the east of Lewis two days behind schedule, crewed by exhausted salvors who had hardly slept. While I told

Liden about this, he listened patiently, with sympathy. Then the retired chief of structural design asked if I thought the rig had got into difficulties because of her *structure*. I said I thought not – that, if anything, her essential strength had prevented a worse disaster. “Good,” said Liden, “good.”



The oil rig Transocean Winner being loaded on to the semi-submersible heavy-lifting ship Hawk.

Broad Bay

The rig had been in Broad Bay for five weeks. Before dawn one morning in September, a salvage master called Sylvia Tervoort stood next to the boot of her car, putting on her work clothes in the dark. Half a mile over her shoulder, illuminated by onboard lights, Winner bobbed at anchor. Tervoort, a slight 38-year-old Dutchwoman from Castricum near Amsterdam, was quickly encased in bulky safety wear. Her padded orange coat was streaked all over with crusted oil. These streaks, she explained, were traceable back to some wild maritime calamity. There was the sunken rig she had helped raise in Alaska. The scuppered bulk carrier refloated in India. A pair of collided cargo ships (one carrying explosives) that had to be separated off Greece. For months in 2012 and 2013, Tervoort had hiked over the exposed hull of Costa Concordia, the Italian cruiseship that ran aground off the coast of Tuscany. Tervoort had for many years worked for the Dutch salvage firm SMIT, the only female salvage master at the company – and perhaps, she thought, in the world. She had never encountered another woman in such a position, and she had been all over: to South America, to Africa, deep out in the Atlantic – wherever a stricken vessel came to occupy the uncertain middle ground between serviceable craft and sea junk, she had been called to attend. Whether she was there to bring a craft back to life, or to siphon off its environment-threatening pollutants before a spill, or simply to strip a ship of its tangible riches before it sank, depended on the situation and the wants of her contractor in each case.

Tervoort put on a helmet and moved towards a motorboat that would take her and her team out to Winner in the bay. For this job, SMIT had been contracted by Transocean to

oversee the curious work of fixing up a maimed and ailing rig, in order that that it might resume its voyage to be destroyed absolutely. Tervoort was "not interested in the politics" – as with the grounded fuel carrier she had dragged off a beach in Morocco, and the flaming cargo ship her team had boarded at sea, "a job's a job. If people are happy making the signature on my salary, it's OK." As a salvage master, she tended to think about troubled vessels in binary terms. If not "assets" still afloat, then "wrecks". She knew the transition from asset to wreck could be lethally quick, and a consequence of either impatience or overcaution by salvors.

With Winner, Tervoort had prescribed caution rather than haste – much to the frustration, I was told, of authorities, who would have preferred to see the rig leave Scotland as quickly as possible. Tervoort would not be hurried. She had once spent a month in the hold of a stranded bulk carrier off Cuba, without the means to wash, except when a rainstorm gathered, at which point she trotted up on to deck in her bikini. Her life as a salvor seemed to require that she be in possession of a crazy array of skills: seamanship, engineering, calculus, rope climbing, parkour, mild piracy, among others. More than anything, though, the work demanded composure and courage, plus a total lack of awe about outsized seacraft. Civilians crane their necks and coo at large ships. Tervoort saw only assets – and moreover, assets that itched to become wrecks.

It was in my capacity as a neck-craner that I had followed Winner to the Hebrides, getting as close to the rig as I could, which was never that close. Tervoort's team arrived in the car park, bussed in from the north of the island where they had been billeted at Transocean's expense in a holiday lodge. While they boarded the motorboat, I asked Tervoort if I could sail out with them. Get up close, see the rig. Tervoort replied, levelly, "No." As the boat sped away, I could hear her tease her team about the cold. The sun had started to rise, turning Winner a striking crimson.

On a hillside to the east of the bay, I met a pair of hikers who were admiring the rig and counting the support vessels that floated near her. The most impressive of these vessels, a heavy-lifting ship called Hawk, was one of the largest in her class – really preposterously large, with an awesome rectangular deck that was something like the size of a Pall Mall or a Piccadilly to Winner's Trafalgar Square. Hawk had been ordered to the Hebrides from Singapore. Most of the smaller boats around her were chartered from Lewis. James Morrison, one of the hikers, itemised the mini economic boom that had bobbed in to Lewis with the rig: day rates for sailors, hotels booked out, all those minicab minutes ferrying oil execs back and forth from the airport. As sun and drizzle conspired to form a rainbow over Broad Bay, Morrison pointed out that, for a moment, Winner seemed to float at the end of it.

During the weeks of the rig's stay on Lewis, there had been an unbargained-for turn in public opinion. Though initially seen as a poised steel spider, and a possible environmental threat, residents had by and large become fond of Winner. In pubs and on coastal paths, they discussed the progress of Tervoort's salvage with an easy familiarity, as they did weather or tides. "Every day you look at it," said Norman Macdonald, a taxi driver. "Wherever you drive round this part of the island, you look for the rig, to see how it's doing." When I called to book a room at a B&B, the proprietor asked if I'd like "a room with a rig view". In a Lewis primary school, pupils made cardboard models of Winner, and Tervoort was invited to visit and judge them. If islanders had developed a coy affection for the oil rig, they had become openly adoring of the salvage master, and Tervoort rapidly advanced to local celebrity status. She was invited to take part in the island's fun-run. She gave a hit lecture at a local university, about a salvor's life.

It was Tervoort's opinion that Winner would never survive being towed any serious distance, certainly not to the Mediterranean as planned, and so efforts were directed to get the rig on to the back of the heavy-lifting ship, Hawk. In a complicated process that would involve Hawk sinking herself into the water, drifting beneath the rig and then rising again, Winner would have to be lifted up and carried out of Scotland. They call this dry-towing. It happened in early October, after several false starts. Conditions had to be just right for Hawk to submerge and re-emerge, and islanders had several times gathered at

vantage points to wave the rig away, only for the departure to be called off because of bad weather.

In the end, on 6 October, Winner left Lewis unobserved, stealing away in the dark, her departure as abrupt and even as dashing as her arrival. "I miss her," said Laura Carse, the Dalmore surfer.

Malta

Strapped to Hawk, Winner moved south. She passed the outstretched fingers of mainland Scotland and patiently negotiated the busy shipping lanes of the Irish Sea. On 9 October the crafts passed the mouth of the Channel and then picked up speed, ripping through the Bay of Biscay in the better part of a day.

After a fortnight at sea, both vessels had passed by Spain and Portugal and were in horn-hailing distance of Africa. They sailed between Tangier and Gibraltar and into the Alboran Sea, then pressed on past Sardinia and into the Mediterranean. Standing tall on the deck of her carrier ship, Winner looked as cool and improbable as a heron crossing water on the back of a paddling hippo. Hawk and Winner made Maltese waters on 25 October, dropping anchor off the capital, Valletta. High in the water as she was, Winner was easily visible over the square, stone rooftops of this ancient city, and she drew many Maltese to the seafront. A sightseers' boat, known as a *luzzu*, freighted with tourists, was piloted closer for a look.

At anchor in Malta, repair work was carried out on the rig's damaged pontoons, while her owners exchanged export permissions with various authorities. Otherwise, Winner basked. It was bright and hot in the Mediterranean, and this old rig, once so profoundly chilled by North Sea winters that her steel would be painful to touch, at last warmed through. The Times of Malta sent a photographer to snap a northern celebrity come south to sunbathe. Carmel Pule, a retired professor of engineering, and also a keen sailor and ship-spotter, trained binoculars on Winner from the roof of his home. The 77-year-old had seen countless vessels come and go, Malta being a popular stopping point for shipping enterprise of every sort, and brisk handling of maritime paperwork a key part of the island economy. Pule could not recall seeing an oil rig come in piggy-back before. He got on his motorbike and rode to the coast. "Not beautiful to look at as individual craft," he told his wife that evening, describing the trussed-together Winner and Hawk. But an appealing couple, "together for the sake of convenience, or a temporary love affair".

Pule did it, I did it – we do this, as humans, we humanise seacraft. Vessels are christened under bottles of fizz. They're given nicknames and ascribed character. Months after disembarking Winner for the last time, her crew could describe for me with precision, as if they were established personality traits, the rig's distinctive pitch and roll, the chatter of her anchor chains in wind, the subtle but thrilling smell of helicopter fuel that came through the ventilation system to let them know a batch of letters and newspapers had arrived.

Meanwhile, in Malta, Pule kept a vigil on Winner from his roof, and sent me long emails in which he ruminated on the rig's visible old age, on her retirement, on an end to the obvious usefulness of things; he did not always register a distinction between the vessel's state and his own. Seacraft engender affinity, and perhaps only those who are obliged to take a wider perspective can remain entirely unromantic about them. The master salvor Sylvia Tervoort, who tended to meet vessels when something had gone dreadfully wrong with them, considered my question about whether she felt any affection towards the craft she had worked on and said: "Maybe if this was a movie." When I spoke with Patrizia Heidegger of Shipbreaking Platform, she stressed that her organisation was concerned with the humanitarian and environmental burden of shipbreaking. As such, she was politely unenthusiastic about too much sentiment being spent on the boats. On 24 October, a day before Winner's arrival in Malta, Transocean had put out a statement to investors, confirming her sale as scrap. The company added that the rig would now be dismantled; "recycled" was their word. In describing a great, curling route out of Scandinavia, west and then south and then east (east, east) to the Med, Winner had passed

18 EU-approved facilities for shipbreaking, including those in Fosen in Norway, Grenaa in Denmark, Lowestoft in England, Bordeaux in France, Ghent in Belgium and Vinaroz in Spain. Unwanted sea junk does not often find its way to Europe, or stay long there. Had Winner been a fixed-drill platform, built into northern bedrock, exacting regulations and conventions would have insisted that this structure be dismantled and recycled in place. When an oil rig has an engine and a propeller, however – when she is classed as a vessel; a mobile *she*, not a stationary *it* – regulations can be outdistanced. Berths can be sought where conventions are not quite so stringent.

And to sail a condemned vessel east from Europe is to adjust the financials of a demolition substantially. A secondhand vessel is currently worth about \$190 per tonne to a shipbreaking yard in Turkey, a price established by the local market in reclaimed steel. Sail on to China and a different market, and the same metal is worth \$210 per tonne. At breakers' yards in Alang in India, Chittagong in Bangladesh and Gadani in Pakistan, they will pay around \$280 per tonne. Meanwhile, at the EU-approved shipbreaking sites, which are bound to conform to continental waste laws, and where vessels are dismantled in closed-off quays or dry docks, rates are less competitive: European yards offer zero dollars per tonne, and, in fact, tend to ask a fee to take a shipowners' junk. Of the 864 vessels that were dismantled around the world last year, nine were dismantled in Europe. Give or take a dozen (sent to Mexico, the Philippines, Russia and South Korea), the remainder went to breaking yards in Turkey, China, India, Bangladesh and Pakistan.

The NGO Shipbreaking Platform has for some years tracked the movements of surplus ships to these sites, finding it necessary, over time, to start documenting human as well as vessel expiry. They add to their records the blunt, dire summaries of a tragedy every time a shipbreaker is killed in an accident anywhere in the world. Chaudhry Baliram Indrajit, crushed by a crane in Alang in January 2016. Muhammad Asif, killed by fire in Gadani in March 2016. Shibbir Ahmed and Jalal Uddin, both of whom fell to their deaths in Chittagong in July 2016. There are dozens of such deaths every year, the majority of them in yards in India, Bangladesh and Pakistan, where men and boys pick apart vessels without appropriate tools or safety equipment, assuming terrific risks. As Winner underwent repairs in Malta, that October, the tally of acknowledged deaths in 2016 stood at 30, all in yards in south Asia.

Of those 864 vessels sent for demolition that year, 668 went to yards in that region. "The incentive is to go to south Asia," said Patrizia Heidegger of Shipbreaking Platform, "because the highest price paid per tonne is there." Whether individual shipowners took up that incentive depended, in her view, on a moral-financial reckoning. How much they cared about profits, as against how much they cared. "The reason you have owners going to beaches in India, Pakistan and Bangladesh is money," said Petter Heier, head of Grieg Green, a subsidiary of the Norwegian maritime group Grieg established to promote and advise on responsible shipbreaking. Since 2010, Heier has sought to persuade divesting owners to send their excess to one of a group of vetted breaking yards in Turkey and China, rather than the higher-paying, less-audited yards in south Asia. Heier continued: "There are major accidents in India, Pakistan and Bangladesh every week. No company wants to be associated with that. So they sell through middlemen. They change the name of their vessels. They try to hide their [radar] tracking."

These evasions infuriate the watchdog groups in their efforts to hold a shadowy industry to account, but do not always scuttle them. For instance, Shipbreaking Platform had laboriously tracked through its final movements a German-owned cargo ship called HS Colon, which happened to arrive in Malta at the same time as Winner. While at anchor in the Mediterranean, HS Colon disappeared. When the NGO caught up with her, she had undergone a brisk identity change, shedding the initials that linked her to her former owners, Hansa Treuhand, and was heading for Alang under the name of Colo. That month, a tanker called Gaz Fountain was bought for scrap by a yard in Gadani. Before she sailed, Gaz Fountain became Rain. On 9 January this year, Rain caught fire during demolition on a Pakistani beach, killing five workers. A few weeks earlier, in November, another ship had exploded at Gadani, killing at least 27 workers.

Still astride Hawk, Winner left Maltese waters on 27 October. She moved east towards Crete and wove between a scattering of Aegean islands. She was bound for Turkey, and a place on its west coast called Aliaga, where the Turkish shipbreaking industry is based. This was an expensive choice of destination by Transocean. Around \$80 or \$90 per tonne in value had been foregone, more than \$1m in total, compared with what might have been wrangled for Winner from a yard in south Asia. Petter Heier at Grieg Green said he believed that – slowly, gradually – owners such as Transocean were coming to acknowledge the longer-term, intangible gains of careful disposal, even if this meant shorter-term, tangible loss. “Insurance companies are putting pressure on shipowners to recycle responsibly. Their employees are putting pressure. Society is putting pressure.” In the case of Transocean, Heier offered an opinion (“a personal opinion”) that the company was further influenced in its thinking by its involvement in the Deepwater Horizon catastrophe. When it exploded in the Gulf of Mexico in 2010, Deepwater Horizon was contracted, notoriously, to BP. But it was Transocean’s rig.

“I would guess Deepwater Horizon triggered something,” Heier said. “They are very careful [now], that if something happens with them on the beach in India, Bangladesh or Pakistan, that might ruin their name in the market.” When I expressed surprise that Winner should have departed Malta still a Winner, without a change of identity in the manner of Colon or Gaz Fountain, Heier said: “They didn’t change the name because they didn’t need to hide anything. They chose a good yard.”



Transocean Winner oil rig arrives in Aliaga, Turkey to be dismantled.

Aliaga

They lit up the shore with flares on the day the rig came in at Aliaga. This was to acknowledge the end of a three-week journey that had ended up taking three months, and to show a pack of tugboats – now that Winner was off the submerged Hawk and being pulled and pushed towards the beach – just where to put her. The float-off took place at lunchtime on 5 November. Winner had a token crew again: representatives from Transocean and SMIT back aboard for the final tow. Guiding flares on the shore, at least from Winner’s deck, appeared only as spots of fire among hundreds. Aliaga beach was

afame – in the shallows, where carcasses of ships and rigs were disassembled by spark-showering blowtorches, and in the narrow yards beyond, where amputated pieces were further torched. Dense smoke filled the air above the yards.

From the water, it must have appeared to the uninitiated that Aliaga had been freshly, plentifully bombed; perhaps doused and jumbled by tidal waves, too. In fact, this was a normal working day on the beach. At its western edge, a Del Monte fruit boat had been perfectly halved. To the east was a cargo carrier, Modern Express, that had some months earlier been abandoned by her crew while stricken and drifting in the Bay of Biscay. Nearby were two demobbed frigates, recently owned by the Spanish navy. Winner was put in next to the halved Del Monte boat, on a part of the beach owned by a local shipbreaking company called Isiksan.

Isiksan's foreman, a muscular 30-year-old Istanbulite named Hüsseyin Essen, sailed out to meet the rig. Essen had been the foreman here when Isiksan accepted its first oil rig for demolition, in early 2015. Ocean Concord had shown up 200 metres from the shore, and when Essen and his colleagues sailed out to meet her, they had no idea what to do next. Ever since they started shipbreaking in Aliaga in the 1970s, vessels had been brought ashore using a method known as "beaching"; that is, they were piloted inland and made to mount the beach at speed. (Trembling phone footage from 2013 of a ferry being beached in an explosion of smoke and water has been viewed more than 3m times on YouTube.) With the sterns half-ashore, breakers could then cut in and dismantle the ships laterally, as a snacker might eat through a baguette. But oil rigs were not fast enough or strong enough for beaching. "We didn't know what the hell we were going to do," Essen said. There was an idea to work on Concord at sea. In the end, heavy chains were tied around her legs and connected via winches to powerful vehicles on the shore. Concord was hauled through the shallows like a struggling fish. Through many oil rig landings since, this method had proved fine. Winner, towed and carried and storm-propelled on this fantastically harried trip east, would be dragged the last metres by straining bulldozers.

Unlike the colossal breakers' beaches of south Asia, or the disparate yards scattered around coastal China, Turkish shipbreaking is packed close in one place, concentrated entirely on this government-allotted mile of coast on the outskirts of Aliaga. The beach here has been divided into as many slim, neighbouring yards as will fit – 25 of them. Considering its comparative scale, Aliaga should be a minor consumer of the world's excess sea-tonnage. But since Ocean Concord arrived 18 months ago, it has established itself, improbably, as the world's foremost consumer of oil rigs. Something like 300,000 tonnes of unwanted rig had been brought here – Hunter and Yatzy and JW McLean and John Shaw and Southern Cross and Aleutian Key and Amirante and Scarabeo 4 and Arctic I and Arctic III – as well as that pair of young Encos, the two rigs that were barely a decade old when they were sent by their owners for disposal. The Isiksan yard, its opening on to the Aegean no wider than an average-sized rig, had undertaken most of the demolitions. Petter Heier of Grieg Green, which advised Transocean on these latter stages of the disposal, said Isiksan had been chosen because of this expertise.

It was expertise hard-won. Essen and his colleagues learned over the months that the best way to scrap a rig was to deposit a group of blowtorchers on the upper deck (carrying them there in a crane-hoisted cage) and then to let them burn their way downwards. The process took months, but because more men could get at more vessel on a rig than on a beached ship, and because rigs tended to have cranes that could be co-opted into the effort of self-destruction, Essen's scrappers were getting faster and faster at their work. With Winner, they targeted the helipad first, weakening it with blowtorches before a crane came in to pick it clean away. Winner's galley went next, then half her accommodation block. A fortnight into the demolition, the horizontal decks were still in place, but the walls between had been so gnawed at that Winner looked like one of the cut-away diagrams sketched by Hader Liden at his drawing board decades earlier.

The rig's sale to Isiksan was formalised and finalised the moment she came off the back of Hawk. In the words of Isiksan's young chief, a 26-year-old Aliagan named Soner Sari, Winner was a "cooked meal", in that she had been brought to the yard whole and the

workers there only had to digest her. They did this by cutting 50-tonne pieces off her, lifting these pieces into the yard, where the steel could be separated from everything else, then trucking off this valuable metal in one-metre-squared pieces that would be sold to a foundry nearby. Not all vessels in Aliaga were “cooked meals”. Other deals struck by Sari specified that Isiksan must fetch unwanted craft from wherever they had outlasted their use. These agreements, known in the industry as “cash-buyer” deals, could be profitable – but they were also risky. Early in 2016, an old ship called Bannock had been cash-bought by Sari from her owners in Italy. Sailed into the Matapan Sea, bound for Aliaga, Bannock had quickly listed and capsized, ceasing to exist in the old-fashioned way, by sinking to the bottom. “That was a shitty feeling,” Sari said.

We were sitting in his office on the yard, watching the slow destruction of Winner through a picture window. Boyish, dark, smartly dressed, Sari sometimes threw out his hands when he spoke, showing a bracelet on each wrist, one of them decorated with pictures of turtles. He had a Range Rover parked outside, in which we had driven together from central Aliaga, passing various chemical factories, oil refineries and foundries. Closer to the breakers’ beach, an informal flea market of maritime bric-a-brac had been established, where traders sold recovered items from the dismantled ships. Sari continued: “When we buy in a faraway port it’s cheaper, because we’re taking certain risks, and if it works out, we’ll we make money for taking those risks.” On his phone he had photographs of Bannock sinking. “At that point, your company’s \$20m – or whatever you’ve paid – is gone. Poof. It hurts.”

Sari did not want to say exactly how much Isiksan had paid Transocean for the right to scrap Winner. Estimating based on local market rates, it could have been as much as \$3.5m, though Sari only allowed that it was a seven-figure sum, and that Isiksan expected to turn a profit on the recovered steel. Parts other than a rig’s steel could also be valuable to a breaking firm – for instance, any deck cranes that were in resellable condition. The lifeboats that came stitched to vessels could also be sold on to the bric-a-brac guys beyond the yard. Hundreds waited to be sold there, bordering the road like giant orange crash barriers.

Through Sari’s office window, we looked at a newly removed piece of Winner’s accommodation block, which had just been brought up into the yard. It might once have been a section of corridor, and electric cabling and insulation foam still clung to its steel walls. A hydraulic excavator started tossing and rolling it in the dirt – cartwheeling it over and over to shake away the wire and the foam. By the end of the day, Sari judged, that steel would be on a foundry floor. About \$3,000 worth, he said, pricing it by eye.

While we drank strong, tarry coffee, we discussed the environmental consequences of shipbreaking. It was no coincidence, Sari said, that Aliaga’s yards were huddled up beside refineries and foundries. Heavy industry had been moved to Aliaga en masse in the 1970s, “because the government wanted to wrap it up in one area, keep everything *else* nice”. Sari acknowledged that the local yards had not always upheld the strictest standards when it came to minimising environmental damage, but he was working to change that. Beneath the Isiksan yard he had installed a drainage system to catch and pump off pollutants. Down in the water there were brightly coloured booms, bobbing in a circle around Winner’s legs, there in theory to stop any floating waste from getting out into the Aegean. A confidential 2015 report by the shipping consultancy Litehauz, obtained by journalists from the investigative agency Danwatch last year, detailed the potential impact of ships that were torch-cut on tidal water. The report estimated that for every 10,000 tonnes of vessel torched, about 120 tonnes of molten steel and two tonnes of chipped-away paint escaped into the sea. Sari insisted that the water off Isiksan’s yard was regularly tested for pollutants. When I asked if he would swim out there, he thought for a moment and answered: “Why not?” Petter Heier of Grieg Green said his company had audited the Isiksan yard and found its environmental procedures acceptable. Look, Sari said, it might be distasteful, but somebody had to get rid of shipowners’ garbage. He gestured at the yard through the window. In his view, it was better that it happened out there than on the deadly beaches of Alang or Chittagong. He had applied for European recognition for the Isiksan yard, hoping to see it added to a list of EU-approved shipbreaking sites.



Ship-breaking yards in the Turkish port city of Aliaga.

We took a walk together through the yard, where the immediate noise was at first so much to contend with – the guttural, football-crowd “Ooooh!” of ignited blowtorches, the grating complaint of metal on metal, bulldozer rumbles, generator whines – that I put off the matter of sights until a second lap. In the reddish-brown dust, fine as powder in places, a combination of soil and dirt and tiny coloured chips of paint, I found a Norwegian chocolate bar called a Stratos, still in its packaging. Nearby was a plastic shoehorn, apparently flung from the cartwheeling corridor, and a takeaway menu from a Chinese restaurant in Lewis. The discoveries increased in size – a gas mask, a boot, a barrel on fire, a pile of fire extinguishers, a larger mountain of green and white foam – until we were standing beside great, upright sections of mud pipe, tall enough for a person to walk through, cut into giant, swiss-roll slices and now being lifted into the bed of a truck.

Early in Winner’s demolition, a big, square piece of her decking, like the mat of a boxing ring, had been retained because it was flat and smooth and would skim briskly through the dusty yard when dragged behind a bulldozer. It now served as a carrying palette for the rig’s disparate amputations, and brought sliding up from the shore an entire utility closet, placed upside down. An equipment rack on the closet’s outer wall was slung with vices, chains and thick bolts the size of milk bottles. A sign above the inverted door warned that it might close violently at sea. When I tried to step inside, Sari said: “Uh, don’t go in there yet.” He indicated that parts of the room were so freshly torched that they were still smouldering.

Airhorns sounded: lunch. I walked among yellow-helmeted breakers – about 70 of them were rostered to work today – as they streamed off Winner. The men I met lived locally. They said they earned wages of about \$1,300 a month. According to investigations by Asli Odman, a member of Labour Watch Turkey, there had been at least 10 fatal accidents in

the various yards of Aliaga since 2010. On the oil-refining ship Kuito, being dismantled at a neighbouring yard in 2015, a worker fell into the hold and died. On the cruise ship Pacific, dismantled by Izmir Ship Recycling Co in 2013, two workers were poisoned by carbon monoxide. I asked a 31-year-old Isiksan employee named Zafer Erdem, who operated a crane, whether he felt any fear whenever the next new rig arrived for demolition. No, said Erdem, when a rig came in he thought: work, two or three months of it. Erdem and his colleague Kamil Conge, a 45-year-old field manager, had a combined 30 years of experience on the beach. An inch beneath the dirt, Conge said, there was a layer of concrete that extended most of the way to the shore – a recent addition, before which the yard became a muddy horror whenever it rained. In those days, Conge said, a ship “could take a year to dismantle”. I was told there had been injuries to workers in the Isiksan yard; accidental scorchings was the example given. Everyone remembered the recent death on Kuito, along the beach. Work stopped for a day in a show of respect.

Not far from the mess hall, in the mud, I came across something colourful – a Norwegian consumer magazine, six years out of date and splayed open at an article about red wines. A 26-year-old yard worker called Omer Dogan, about to skip lunch and go to prayers at a nearby mosque, said they had sometimes found “funnier stuff” on incoming oil rigs. Omer reddened, not wanting to say pornography. Hüsseyin Essen told me he had many times come across collections of family photographs. Sari was once inspecting a brought-in trawler when he found a full outfit of ski gear in a cupboard. The Spanish frigates had come to Aliaga, he said, stripped of computers, but still with several missile launchers intact. Sari liked it best when they found a certain type of brass valve on ships. Isiksan owned a small foundry that processed non-ferrous metals, mostly salvaged bronze, which would be melted down and fashioned into storm valves, for resale to the shipbuilding industry. Sometimes, Isiksan’s valves found their way back to Isiksan, got removed and were melted down again. I mentioned to Sari that I had met a man on the Isle of Lewis, an eccentric local professor called Arne Vögler, who had led a volunteer mission to scour the waters of Dalmore Bay after Winner had gone. Vögler, searching for debris that might harm the environment, had ended up fishing out Winner’s enormous propeller. He joked to me about installing it as garden furniture. Hearing this, Sari raised an eyebrow. “I wondered where that propeller had gone,” he said, and sniffed. “Brass alloy. Tell the guy he owes me \$50,000.”

At the water’s edge, the big steel carrying palette waited in the dirt. Sari stood on one of its upturned corners, hands in his pockets, bouncing on the flexible metal. The Aegean lapped at Winner’s ruptured pontoons. From here I could see the intricate patterning of rust up the oil rig’s legs – grades of peach, grey, green, black and bleach-white stains, recording, as if they were a sailor’s tattoos, Winner’s many tours in the North Sea. I knew from studying Hadar Liden’s sketches that the thick legs were actually hollow, with ladders inside them to provide a route between the decks and the pontoons in case of emergency. In Aliaga, a doorway had been torched in one of these forward legs, and square windows cut at intervals up to the deck, so that when his workers climbed, Sari said, they didn’t have to do so in the dark. I suggested that I try climbing up the inside of Winner myself. “No,” said Sari. By this point I was accustomed to being refused requests to get aboard the rig. “No,” he continued, “I’ve tried going up by the ladder and it’s like scaling a 10-storey building. Better take the cage.”

He signalled to an operator in a nearby crane, who answered by rotating and depositing on the shore a carry-cage about the size of a couple of telephone boxes, painted blood-red. I stepped inside and held on to the cage’s central pole, like a commuter on a bus, as it was hoisted fast into the air, spinning through several terrible rotations before settling into a queasy, side-to-side sway. Before landing the cage on the rig, the crane swung me high and wide above the beach, so that for the first time I could see the full, fiery chaos of Aliaga. The fruit boats and frigates and oil rigs were not going quietly, but inchingly, they were going; and soon their berths on the shore would be filled by the next redundant or repented-of thing.

Back in his office, I had asked Sari what would happen when the world's fleet had been adequately thinned, when there were no more superfluous rigs for him to buy and dismantle. He said he expected this to happen soon. "Next year? The year after?" As rigs disappeared, rates to hire the remaining ones would rise and, eventually, an incautious oil industry would find an economic (if not glowingly ethical) equilibrium. "And we'll go looking for the next thing." Sari had in mind a smaller type of oil platform known as a jack-up, of which there were many hundreds filling the seas. "Cold-stacked all over, no jobs, no *prospects* of jobs ..."

I asked him if it ever seemed a pity to break up such monumental and characterful structures. Did he look at Winner in the way that I had come to look at her, in the way her former crew looked at her, as something dignified? Sari said the only emotion he could feel about Winner was relief, when she was gone, on schedule. But not long ago, he acknowledged, he had had a wobble. It was over those two young Ensco rigs – Ensco 6003 and 6004 – that had come out of Brazilian waters. When Sari won the right to scrap them, he took the unusual decision to sail the rigs under their own power from South America to Turkey. "I piloted one myself, for the last mile to Aliaga. I wanted to try it out." Sari mimed adjusting thrusters, striking buttons. "Everything was like new, all the controls." They demolished Ensco 6003 and 6004 over the course of about 10 weeks. "Beautiful machines. Beautiful machines," Sari said.

On the Transocean Winner

The cage was lowered on to Winner's deck, where it smelled of propane and singed steel, of grease and hydraulic fuel. Disorientatingly, here, the rig's insides were outside, so that a payphone that had once stood in the accommodation block was now upright and exposed in the open air. Two ping-pong balls, mysterious survivors of the long voyage, juddered on the payphone's coin shelf. Nearby, blowtorches cut their way out from inside a cabin, and above them a deputation of breakers directed liquid from a hose into a vat marked "Chemical Spill". Thinking of the geologist Brit Fredheim, and her evening constitutionals around the rig, I set off to walk Winner's circumference.

All along the perimeter fence were signs that ordered "Respect this barrier", signs that continued until the barrier fell away completely, mangled, torn and disrespected by the storm back in the Hebrides. I moved towards the interior, passing pools of standing water on the corrugated floor, and crater-bursts of rust where it was dry. Someone had left a dozen eggs on the floor by a ladder. There were stacks of dusty computer towers in a cupboard, and orange lifejackets that filled two bath-sized tubs to the brim. In a windowless office, where there were two leather-effect chairs and a tacked-up poster of a motorbike, I found a whiteboard on which somebody had written "Crew 6 says goodbye". Below, on a shelf, there was a leather-bound logbook, neatly filled with the signatures of men and women who had seen through a particular watch on Winner. There were pages and pages of names, going back to the early 1990s. I considered stealing the book, or adding my own signature. In the end, I put it back on the shelf, to be destroyed with the rest. Outside, I passed Zafer Erdem in his crane, merrily terrorising a piece of racking at the base of the derrick. We waved.

By the end of November, Winner had been stripped of everything above the midriff, bar her derrick. This was pulled down on 3 December, then chained to bulldozers, which laboured until the tower toppled forward; instead of landing on an outstretched jetty that was meant to catch the pieces, it twisted and crashed pinnacle-first into the shallows. Once the pieces had been fished out, work resumed to reduce the rig's legs. By mid-December, Winner amounted to little more than a pair of pontoons under blackened stumps, the dwindling structure kept stable by thin strips of horizontal decking, so that it resembled a pair of ice skates strung together by the laces. By Christmas Day, only the pontoons were left. These were dragged out of the water and into the dirt so that another unwanted rig, Transocean Driller, could be parked on the slipway behind. Winner's port-side pontoon was sliced up and trucked away in the first days of January. Very likely, by this point, there

were swirls of the rig's old steel in the refashioned blocks and beams that were leaving the local foundries, to be sold on for use in construction projects around the Turkish interior. On 5 January, something curious happened on Aliaga beach. Winner's final piece, her starboard pontoon, was half gone. Snow began to fall, rare in this part of Turkey, carrying on for four days and keeping the breakers from their work. A reprieve – days in which Winner was left out and unmolested, in weather she knew well. By the following week, the snow had gone and the cutting resumed. The last of the pontoon was lifted on to a truck on 13 January, and smelted that afternoon.

Inséré 28/04/22 DOSSIER Enlevé 28/05/22

Lessons learned from scrubber installation and operation

At the beginning of this year, the IMO's global sulfur cap on marine fuels entered into force and shipowners who chose the SOx -scrubber pathway to compliance began the modern era of emissions reduction.

Scrubbers have been operating in marine environments for almost 30 years, so owners were not exactly entering a brave new world of technology. But any time a new technology is integrated into an individual vessel's operating system, lessons are learned; and these lessons create a knowledge base that operators with less experience with scrubbers can draw from.



*The 2016 built 318.625 DWT scrubber equipped **NEW CONSTANT** enroute from Yuum Kaknaab (Mexico) to Daesan (Korea) with a draft of 21.5 mtr*

Leading class societies have been supporting scrubber integration in the marine environment since their first application. ABS, for one, has gathered the depth of market intelligence required to help owners to improve the process of installing and operating most scrubber systems. Lessons have been learned about everything from installation and commissioning to the most common hardware failures for operating systems, and the type of consumables that are typically needed.

In this post, we will discuss some of the key issues associated with the installation and operation of scrubbers. But for a comprehensive list, please download ABS's guide, Practical Considerations for the Installation and Operation of Exhaust Gas Cleaning Systems.

In commissioning SO_x Scrubber systems, there can be challenges associated with extensive test periods, usually the result of an owner/operator having limited test plans and/or pre-commissioning work. This may be relatively intuitive, but following an approved test plan and completing the pre-commissioning activities are the fastest way to avoid these problems. Another recurrent problem we are seeing, specifically during the installation process, is when wash-water is carried over with the exhaust gas. This is commonly the result of unsuitable or inefficient flowpaths for the exhaust gas and can be resolved by optimizing the flowpath and/or modifying the design of the demister, which removes liquid droplets from the vapor stream.

Below are some more symptoms that operators are experiencing, and potential solutions:

HIGH EXHAUST BACK-PRESSURE:

This is likely due to either undersized scrubbers, sharp bends in exhaust piping, water-spray resistance, or a failure of the bypass-isolation valve interlock. Ultimately, the system's design usually can be improved through simulations that identify the potential sources of back-pressure.

INTERRUPTED OPERATIONS

In the case of washwater supply, the problem can be caused by clogged filters in the supply piping. But when frequent operational interruptions become problematic, it is constructive to thoroughly examine your redundancy options. A failure mode and effect analysis can support this process.

NON-COMPLIANT PERFORMANCE

(eg., washwater pH value, SO₂/CO₂ ratio): These symptoms could be due to inadequacies in the washwater, low alkalinity in the water supply or simply an ineffective water-spray pattern. Improving the overall design, a process that can be verified through the use of computation fluid dynamics modeling, and verification of alkalinity levels in the water supply may resolve the issue.



*Capital's 2010 built 297.958 DWT **ALEXANDER THE GREAT** arriving from Zhousan offshore Singapore*

POOR RELIABILITY OF MONITORING SYSTEMS

(including instrument malfunction): These symptoms can be caused by many issues, including the simple fact that the monitoring system may not be designed for marine applications. Other possible causes include that it may not be calibrated or installed correctly. Start by ensuring that the monitoring system is approved for marine use, and then follow the manufacturer's instructions for calibration and maintenance.

HARDWARE FAILURE

When a SO_x Scrubber system suffers a hardware failure there can be multiple causes. Below are some that industry- operating history suggests owner/operators may want to consider investigating when searching for solutions:

- The sampling tubing may have become clogged, preventing accurate readings of SO₂/CO₂ ratios in the exhaust gas
- The pressure transducers at the bottom of the pipe run may have become clogged with debris because the sensors were located in the wrong places
- The demister in the scrubber chamber may have malfunctioned due to a build-up of deposits
- Defective welds on piping system could have allowed washwater to leak
- Low-grade stainless steel (e.g. SS316 for fittings inside the scrubber chamber) may not have held up to the corrosive operating environment
- The metallic pipe section on the side shell used to discharge washwater also may be corroded
- The air pump that samples exhaust gases may not be working properly

- The scrubber's uptake damper cannot be operated in manual mode
- The mechanical seals for the washwater feed pumps may have failed
- The automation controls for printed circuit boards may have failed

MAJOR INCIDENTS CAUSING ENGINE SHUTDOWN AND DAMAGE:

History has taught the industry that most costly asset failures are the result of human error. The actions may be well-intentioned, but crews need to be fully trained to operate specific systems and to discourage any efforts to operate them in a mode that would disregard the control system, or manufacturer recommendations for upkeep. In one recent event, a main engine stalled due to high backpressure after a scrubber by-pass damper failed to open when the scrubber uptake damper was closing. The programmable logic controller that was designed to control the interlock of the by-pass and uptake dampers had failed. Regular maintenance and testing in accordance with manufacturer's instructions could have identified the problem. The incident made clear that safety features require regular maintenance and testing in accordance with the manufacturer's instructions, and that crews in charge of any system need to be familiar with basic starting procedures, such as checking damper positions and safety features. In general, the industry has learned a lot about exhaust-gas scrubbers in the 30 years since they were first used in marine applications. The average owner may have become relatively familiar with the individual systems they chose to use. However, leading class societies such as ABS will have learned the lessons from many systems, and have the depth of to help owners with any challenges they may face.

Source: ABS

Inséré 29/04/22 NIEUWS NOUVELLES Enlevé 29/05/22

Damen signs up Erma First to supply world's smallest ballast water treatment system

Damen has signed its first contract with ballast water treatment systems producer Erma First. Greek company Erma First will be supplying its oneTANK, which is the world's smallest ballast water treatment system. oneTANK uses chemical injection methods to clean ships' ballast water and therefore represents an important expansion of Damen's ballast water treatment system portfolio. The contract also marks a key milestone in the cooperation between Damen and the Greek maritime supply sector.

Damen Green Solutions has a broad selection of ballast water treatment systems in its range. These offer ship-owners various capacities and techniques in treating their ballast water. With the addition of the Erma First oneTANK, Damen can provide clients with a solution that is not only small, but also modular.

This modularity will be particularly important in Damen's first project with Erma First, where the client was looking for a plug-and-play ballast water treatment product that could be placed on the deck of its vessel.



Small

but

“Our client needed a temporary ballast water treatment solution for quite an old vessel,” explains Damen sales manager Rutger van Dam. “Erma First’s oneTANK is small enough to be housed in a twenty-foot container. This means that installation will be quite straightforward and, more importantly, at the end of the vessel’s operational life, the whole system can be removed and installed on another vessel.”

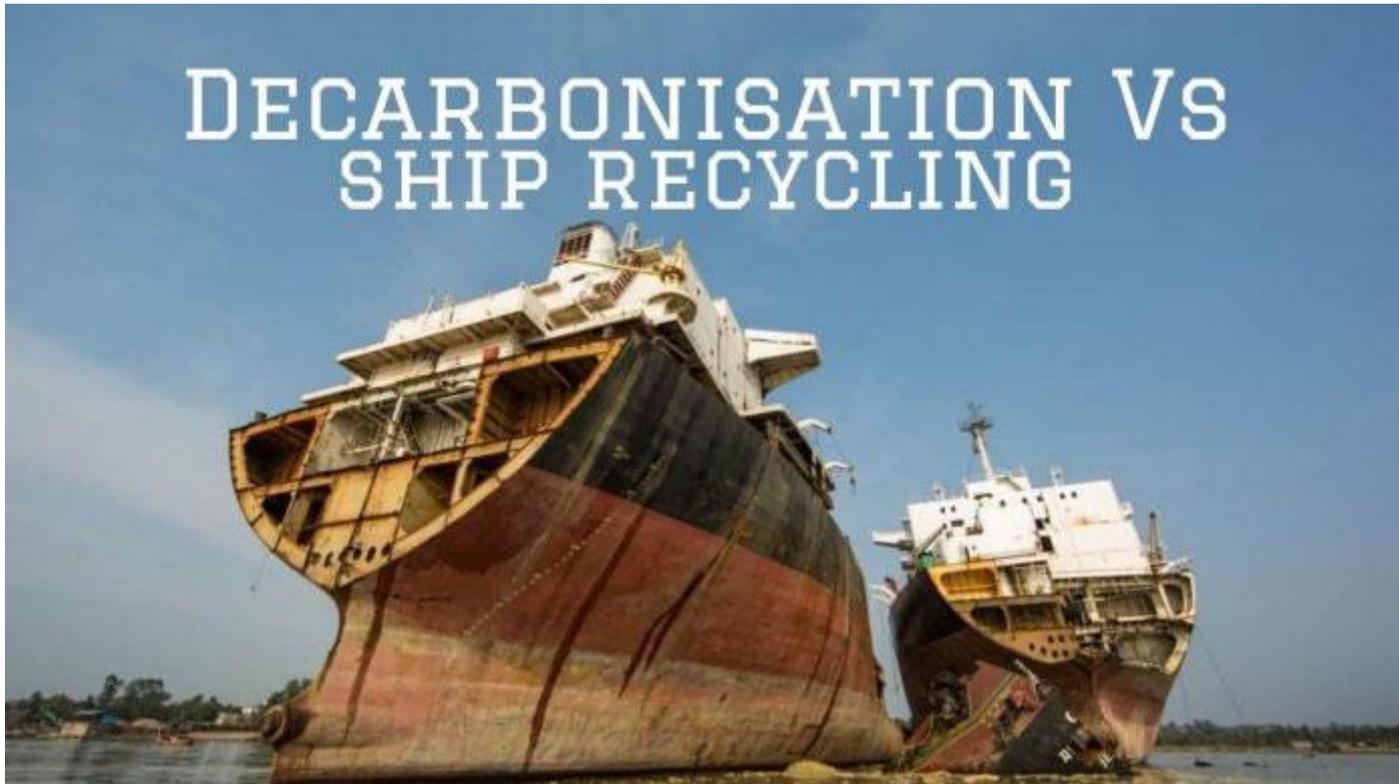
The contract is important to Damen because it broadens the scope of ballast water treatment products that it can offer its clients. “We have different systems available from various manufacturers. We know the pros and cons of all these systems; they have varying capacities and use different techniques: UV, filtration, electrolysis, and now chemical injection. Whatever the client requires, we have the knowledge and experience in house to offer exactly what our they are looking for.” “To treat a vessel’s ballast water, the fully-certified Erma First oneTANK uses an 8.25% or 12.5% sodium hypochlorite and 30% sodium thiosulfate solution, with both chemicals being neutralised after use. “For owners working with workboats, superyachts and pontoons (smaller vessels) that are not dependent on frequent ballast operations, oneTANK is a great solution,” continues Van Dam.

Cooperation with the Greek maritime industry

“We are very happy to be working with Damen on this project. We will support their client with our extensive knowledge of ballast water treatment systems wherever we can,” says Erma First Business Development Manager and president of HEMEXPO Eleni Polychronopoulou. “Furthermore, I applaud Damen on their enthusiasm in building relationships with the Greek maritime industry. Such industrial participation is a key part of the modern shipbuilding industry. May this cooperation be a sign of things to come.” “The fact that Erma First is a Greek company is another significant aspect about the contract. Throughout the world, Damen has been involved ‘national ship building’ projects that have combined Damen’s own shipbuilding expertise with the capabilities of local industries and workforce. “We don’t just build ships in our own yards – we can also help our clients build their vessels in the yard of their choice in collaboration with its local industry,” says Damen’s Industrial Participation Manager, Marijke Winiarski. “Contracts like this with Erma First are exemplary of Damen’s approach towards the involvement of local industries in our projects, paving the way for local companies to benefit from Damen’s international opportunities, whilst simultaneously helping Damen to develop new partnerships, such as this one with Erma First.”

Inséré 01/05/22 DOSSIER Enlevé 01/06/22

Decarbonisation and shipping: ship recycling - a changing landscape



As the drive to decarbonise shipping gains increasing momentum, and as incentives and pressure on shipowners to operate more efficient and greener ships mounts, a related spike in early retirement of ships difficult to decarbonise and which are losing favour in the market, may result. Consequently, decarbonisation of shipping may drive a boom in ship disposal. But would this support or detract from the overarching goal of reducing damaging impact to the environment and climate?

In this article we consider the past and ongoing environmental issues surrounding ship disposal, provide a summary of the main regulations which seek to address these problems and take a look at the emerging landscape of ship recycling as a life-cycle consideration and not just an end-of-life concern.

We also consider the implications of recent action against owners and buyers, as was the case in the Tide Carrier, North Sea Producer and the Dutch case involving Seatrade which suggests that courts and regulators are taking a closer look at the practices around end-of-life vessels.



Environmental concerns

Ships are large objects that cannot easily be 'thrown away'. Historically, ships at the end of their ocean-going lives have tended to be either repurposed (for example as storage units, prisons or nightclubs), abandoned, sunk or broken up and then disposed of in smaller parts, some of which may be recycled.

When compared to sinking or abandonment of old ships, shipbreaking and recycling is by far the most environmentally-friendly and economically sound option, as it ensures proper management of hazardous material and the reuse of valuable resources such as steel, iron, aluminium and plastics. Unfortunately, only a small percentage of shipbreaking operations are handled in a safe and clean manner. Shipbreaking is a heavy and hazardous industry that exposes workers and the environment to a number of risks, for instance workers are often required to work at height or in confined spaces, with little or no PPE, and ship structures contain numerous toxic materials such as asbestos, PCBs, oil residues, organic waste, heavy metals, and toxic paints.

In 2017, according to the NGO Shipbreaking Platform, 543 ships, representing 80 percent of the world's end-of-life tonnage, were broken under rudimentary and sub-standard conditions on the beaches of Alang in India, Chittagong in Bangladesh and Gadani in Pakistan.

Studies in some of these areas have shown that the pollution caused by shipbreaking can negatively impact local ecosystems due to the increased presence of heavy metals and micro-plastics. For example, the studies observed increased numbers of harmful bacteria and reduced ecologically important organisms such as zooplankton. Furthermore, other studies showed that exposure to the various pollutants found in these environments, including asbestos, risked the health of workers.

Transforming hazardous shipbreaking into sustainable ship recycling necessitates:

- 1- shipowners selling their ships to breakers that invest in their operations' safety and environmental standards;
- 2 -moving shipbreaking away from beaches and onto quaysides and dry-docks in appropriate areas, with the ability to store and handle the waste in a safe manner; and

3 -focusing on green ship design at the outset, reducing hazardous materials in newbuilds and minimising waste at the end-of-life stage by planning for future efficient dismantling. However, there are concerns as to how the implementation of green measures would affect the costs of building, operating and eventually dismantling a ship where substandard and cheaper options are still available. As a result, there has been a reluctance in the current market to adopt more sustainable methods.

While costs implications associated with green ship disposal are a consideration for shipowners, recent case law has shown that international and national courts, as well as environmental authorities, are prepared to examine the practices used by shipowners when scrapping a vessel and to enquire whether ship recycling regulations have been complied with. It has also become clear that authorities are prepared to look back at the decision-making process upon the sale of a vessel to be disposed of, and to assess whether any breaches of regulations have occurred. Consequently, the risk of regulatory breaches, which could result in heavy fines and reputational damage, should also be at the forefront of a ship owner's approach to ship disposal and act as a further incentive to choose greener options.

In view of the risk of prosecution for failing to adhere to ship recycling regulations, ship owners are increasingly advised to conduct appropriate environmental and social due diligence on the yards used for ship disposal, and to adopt a more informed approach in relation to who is buying their vessel, where it will be recycled and whether there will be repercussions to the environment and people.

Shipowners therefore now need to navigate a stricter approach to an already complex set of rules and regulations than in the past.



Regulations overview

Ship recycling regulations have been implemented over time to negate the detrimental effects of ship dismantling and include the following regulations.

Basel Convention and The Basel Convention Ban Amendment

In 1989, the United Nations Environmental Program adopted the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal, following numerous hazardous waste trafficking incidents, which came into force in 1992. The Basel Convention is relevant in the context of ship dismantling, as ships that have reached their end of life contain hazardous materials in their structures. The Basel Convention requires ship wastes to be managed and disposed of in an environmentally friendly way and to minimise the transportation of such wastes. The Ban Amendment entered into force in December 2019 and prohibits the export of hazardous wastes from Organisation for Economic Cooperation and Development (OECD) countries and Liechtenstein, to all non-OECD countries.

Hong Kong Convention

The International Maritime Organization (IMO) Hong Kong International Convention for the Safe and Environmentally Sound Recycling of Ships (HKC) was adopted in May 2009. The HKC seeks to ensure that the various stages of a vessel's life, from construction to recycling, are performed in a safe and environmentally conscious manner. Key requirements of the HKC are that ships carry an inventory of hazardous materials and ship recycling facilities provide a ship recycling plan. However, the HKC has yet to enter into force and will not do so until 24 months after ratification by 15 states, representing 40 percent of world merchant shipping by gross tonnage, have signed it. At present, these requirements have yet to be met.

European Union Waste Shipment Regulation

The European Union Waste Shipment Regulation (EC) No 1013/2006 (EU WSR) transposes the Basel Convention and the Basel Ban Amendment into European Union law. It imposes a set of controls for the shipment of waste within, to and from the EU and imposes a procedure for waste shipment depending on the shipment's destination, the type of waste and manner in which the waste will be processed after shipment.

On 1 January 2021, in a move to bring an end to the export of plastic waste to third countries that lack the resources to manage that waste sustainably, the EU brought into force the EU Commission Delegated Regulation (EU) 2020/2174, amending the EU WSR to include plastic waste. Regulation (EU) 2020/2174 seeks to ban the export of plastic waste, except for clean plastic waste, from the EU to non-OECD countries. As many components of ships are plastic, these Regulations apply to the disposal of ships.

European Union Ship Recycling Regulation

The European Union Ship Recycling Regulation (EU) No 1257/2013 (EU SSR) entered into force on 30 December 2013 and as from 31 December 2020 the EU SSR is now fully implemented. It is the only legal framework in force dedicated to regulating ship recycling. The EU SSR sets requirements for ship recycling facilities to ensure that ship dismantling is performed in an environmentally acceptable manner. It also restricts the use of hazardous materials on ships, and maintains a list of approved ship recycling facilities. While the EU SSR largely reflects the requirements of the HKC, it also includes additional safety, environmental and occupational health and safety standards that go beyond the HKC.

UK Ship Recycling Regulations

The UK Ship Recycling Regulations (UK SRR) give domestic effect to the EU SRR and apply to all UK ships, excluding ships of less than 500GT and UK ships operating throughout their life in UK waters only. If a UK ship operating throughout its life in UK waters only goes to a recycling facility in an EU member state, the EU-SRR will apply.

Ship recycling initiatives and the way forward

As will be noted from the above summary, the industry lacks a global regulation that would create a uniform and level playing field for all involved in the decommissioning of vessels, and would also make compliance less of a challenge. This, coupled with the fact that regulators are now prepared to investigate and enforce financial and criminal penalties, means that shipowners need to conduct enhanced due diligence in relation to where they will dispose of their ships and to ensure strict compliance of ship recycling regulations.

In order to combat this lacuna, and as has also occurred in the decarbonisation space, industry players have stepped up with their own solutions to encourage and support the performance of ship dismantling in an environmental and socially conscious manner. The Ship Recycling Transparency Initiative (SRTI) has been set up to enable shipowners to share data on ship recycling policies, to demonstrate a commitment to transparency and responsible ship recycling practices. Many shipowners and other shipping organisations have also become signatories to the Sustainable Shipping Initiative (SSI) which seeks to improve the overall sustainability of the shipping industry, including ship recycling transparency. Initiatives such as the above enable cargo owners, lenders and other stakeholders to make informed decisions, allowing them to point to a more accountable supply chain and reward good practice. Further, a number of banks have signed the Responsible Ship Recycling Standard (RSRS) to encourage sustainable ship recycling practices and Clubs have also developed ship recycling cover to assist shipowners with the recycling costs.

Shipowners have also begun to develop and implement green recycling policies and have looked to incorporate contractual provisions in ship sale agreements to ensure that a sale leads to the recycling of the ship in an environmentally safe way, thereby raising the bar for other shipowners and industry players to also implement and adhere to green ship recycling policies and practices.

Together with the regulatory framework, national and international enforcement of regulations, and the above-mentioned industry initiatives, has resulted in a heightened focus on ship recycling globally which has led to the scrutinising of existing ship recycling policies and practices. Shipowners are becoming aware of the need to take a more holistic approach to ensuring their vessels and practices are sustainable for the environment and people. This will no doubt have a knock-on effect on those industry players who have yet to incorporate sustainable practices.

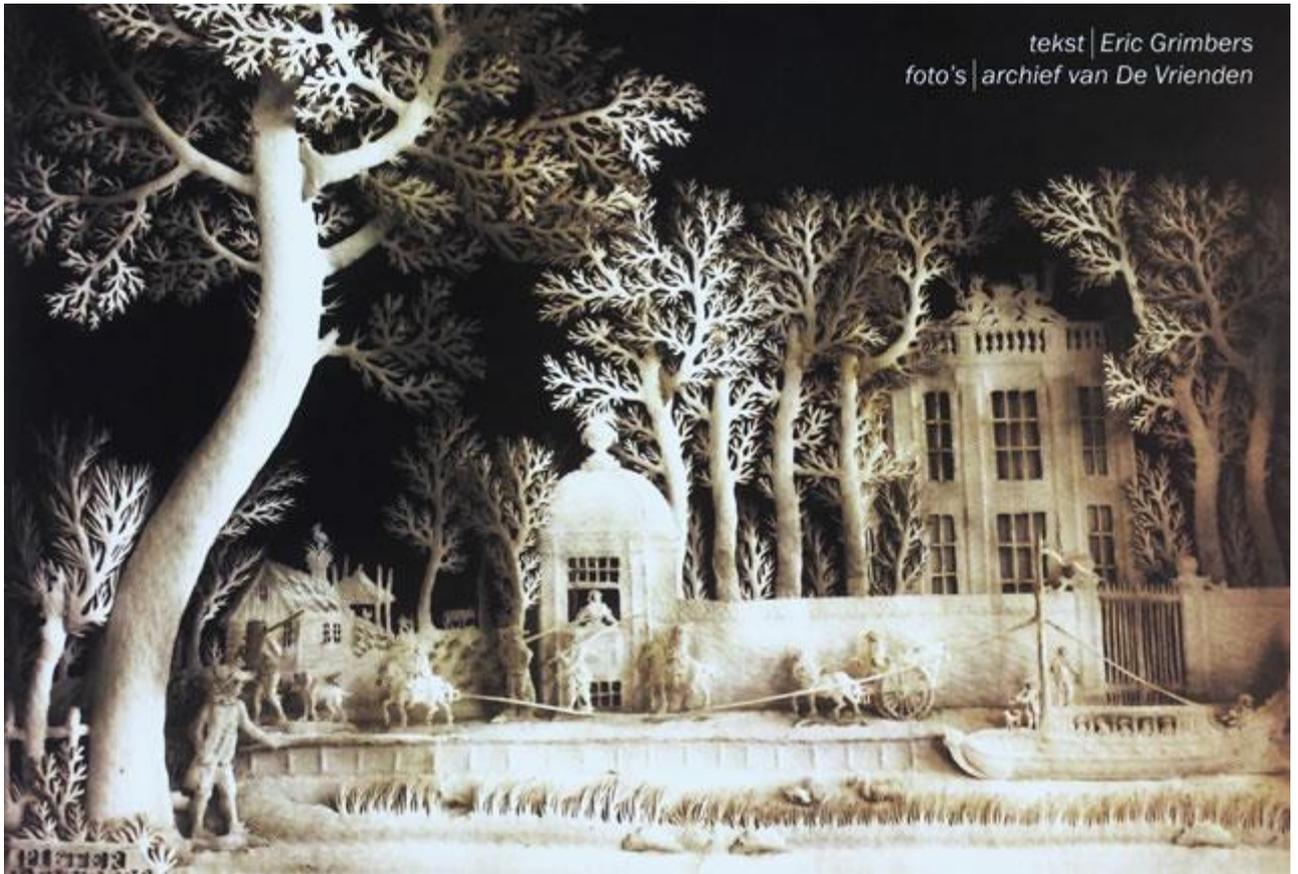
It is clear that legislation and the willingness of authorities to investigate a sale of a ship which is destined for recycling and look at the decisions taken at the time, has placed a heavier burden on shipowners to ensure that the eventual recycling of their ship complies with the applicable regulations. However, while such regulations have come some way from their initial inception in ensuring that environmentally friendly ship recycling measures are in place, the lack of a harmonised set of regulations has meant that varying recycling standards are applied between nations. The uneven legislative playing field has made it difficult for shipowners to ensure compliance and has also allowed for sub-standard facilities to continue to operate in some parts of the world.

Green shipping requires a continuous assessment of a vessel's environmental impacts throughout its life – from the building phase, its operational maintenance, right through to its eventual scrapping and recycling. Similar to decarbonisation, ship recycling is increasingly an area which requires lifecycle consideration, and is not just a concern which arises when a vessel has reached its end of life.

Source: [Hill Dickinson LLP](#) - Rachel Hoyland, Trudie Protopapas and Christina Petroulia

Inséré 03/05/22 HISTORIEK HISTORIQUE Enlevé 03/06/22

De trekschuit



Coulisseknipsel van een trekschuit op het kanaal Oostende-Brugge-Gent. Dit is geen tekening of schilderij maar een afbeelding geknipt uit papier door Pieter Reynders - Harlingen 1801 (Fries scheepvaartmuseum). Dergelijke knipsels zijn vrij zeldzaam.

De Izeren Weg van en naar Antwerpen werd ingehuldigd op 3 mei 1836 met als eindpunt Emplacement Borgerhout ten oosten van de Spaanse Wallen aan de Borgerhoutse Steenweg (nu ter hoogte van de Carnotstraat). Dat eerste eindstation was een miserabel houten gebouw met vier sporen er achter. Dat heugelijk feit wierp echter een grote schaduw, om niet te zeggen de doodsteek, op het eeuwenoude reizen per trekschuit. Het reizigersvervoer per trekschuit gebeurde langs kanalen en rivieren niet alleen bij ons maar ook in o.a. Nederland, Engeland en Duitsland. Dit was bijvoorbeeld het geval langs het kanaal Brussel-Willebroek, de vaart naar Leuven vanuit Mechelen, het kanaal van Gent naar Brugge en andere.

Het kanaal Brussel-Willebroek werd geopend in 1561 met grootse feesten, banketten, vuurwerk en dit gedurende vier dagen. Het is trouwens het oudste kanaal van

de Lage Landen. In Nederland werd de eerste trekvaart gegraven tussen Amsterdam en Haarlem in 1631.



Maquette van een trekschuit met roefje en tent.

Waarom dit kanaal? De Zenne, een kronkelende rivier, toen breder dan nu, verbond Brussel met de Rupel aan het Zennegat. Maar deze rivier liep over het grondgebied van de Heerlijkheid Mechelen en die stad had het stapelrecht gekregen voor zout, vis en haver. Door het stapelrecht

moesten de schippers hun goederen eerst te Mechelen tekoop aanbieden en tol betalen, om ze dan pas nadien te Brussel op de markt te kunnen brengen.

Tevens varieerde de waterstand van de rivier al naargelang de seizoenen, laag bij droog weer en overstromingen bij veel regen of smeltende sneeuw.

Er waren dus redenen genoeg om het kanaal te graven rond het grondgebied van Mechelen. Het hoogteverschil van 10 meter tussen Brussel en Willebroek was een bijkomende moeilijkheid, die moest opgelost worden. Dit werd opgevangen door sluisen te bouwen, wat in die tijd nog niet zo evident was.

De trekschuit had achteraan een roefje waar de eerste klas was. De minder gegoede reizigers zaten in het ruim op lange houten banken, in de tent. Zij waren beschermd tegen weer en wind door een zeil gespannen over het ruim. Later in de 18de eeuw werd het zeil vervangen door houten luiken. Die afdeling bleef echter nog altijd de tentheten. Wanneer het kanaal een bocht maakte, stond op het jaagpad een rolpaal. Deze vrij hoge palen hadden aan de waterzijde een verticale rol, die er voor zorgde dat het trektouw mee de bocht volgde en niet de koorde van de bocht nam, waardoor het schip tegen de wal zou gaan.



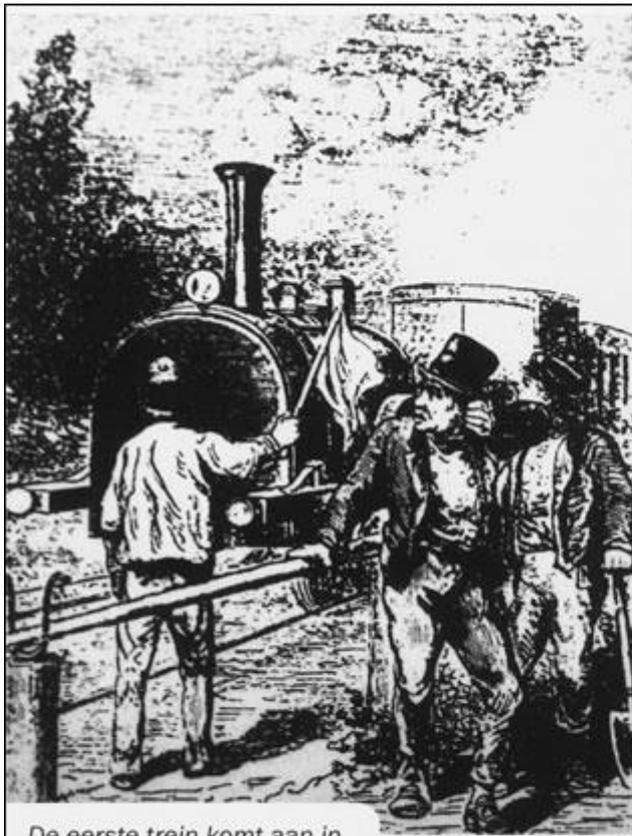
Een omnibus rijtuig met opgedirkte reizigers.



Binnenzicht van een trekschuit.

Het reisverhaal van de Fransman Pierre Sartre uit 1719 geeft ons een mooi beeld van de tocht van Brussel naar Antwerpen:

Men rekent de reis van Brussel slechts op 8 uren, maar ik kwam toch eerst om 5 u 's avonds in Antwerpen toe. Iedere dag vertrekt de schuit in Brussel om 8 u. De trap en het Bureel waar men betaalt, worden om half acht geopend. Men betaalt voor zich zelf en een koffer slechts 29 sous tot in Antwerpen, en ontvangt dan een getekend stukje lood. Wie enkel met de schuit wil varen en te voet gaan vandaar waar de koetsen vertrekken, betaalt min en krijgt een kaart. De schuiten zelf zijn groot, hoog, en schoon. Achterop is een deel overdekt, en er zijn ook enkele rijen zitplaatsen met kussens. Vooraan en in het midden zet men de koffers. De kleine pakjes legt men in gevlochten korven waarop men gaat zitten. Beneden zijn kleine, aardige kamers, een keuken met een oven, thee, koffiegerei en dergelijke. Wie onder dak en op een kussen wil zitten betaalt nog voor elk uur 6 liards (oortjes = koperen muntjes in gebruik in de 17de en 18de eeuw), ook in de kamers beneden, moet men de plaatsenbetalen. Men spant de paarden aan een groot touw, dat van boven den mast neerdaalt. Soms trekken twee paarden, soms drie, vaak zit er een man op, dikwijls loopt hij er slechts naast. Men verandert vier maal van paarden en barken onderweg. Gewoonlijk heeft het overbrengen bij een klein dorp plaats, waar lieden reeds gebak, gebrad, worsten en dergelijke klaar hebben. Iedere reiziger draagt zijn kleine bagage mee, de koffers worden door den schipper, op een slede uit de schuit van het ene schip in 't andere gebracht. Iedereen loopt en spoedt om weer een goede plaats te hebben. Als men weer vertrekt blaast men den horen om de reizigers uit de huizen te saam te roepen. De paarden trekken de schuit uur aan uur. Hoe onaangenaam dit ook voor de reizigers is, het kan toch niet anders. Dit water is een kanaal van de Schelde (Rupel). Het is breed genoeg voor twee schuiten, en loopt vijf uren lang rechtdoor. In het begin ziet men langs beide kanten de schoonste wandelingen van Brussel, dan weiden, velden, landhuizen, kleine dorpen, en een weinig bos. Bij elke wisseling der schuiten is een dok, daarin machines die het water doen stijgen en weer in het volgend kanaal brengen. Men daalt telkens meer en merkt dat men Holland nadert. Ten slotte wordt het schip, met heel wat overslag, in het dok neergelaten. We bleven vijf uur op 't water. De plaats waar men uitstijgt en de Schelde (Rupel) zelf oversteken moet, heet Willebroek. De Schelde (Rupel) is niet diep, tenminste toen was ze (hij) heel ondiep, - op vele plaatsen zag men het zand - maar ze (hij) is geweldig breed. Op die plaats liggen twee schepen klaar voor hen die een loden teken en kaarten afgeven. Pas is men over met het eerste schip, dat men bijna al vecht om plaats in de rijtuigen. Ik kroop er in een langs het venster binnen. Er waren 15 personen in. Men zit heel gedrongen. De weg van daar naar Antwerpen is ene twee uur en half lange, rechte zeer aangename baan. Men ziet de torens wel anderhalf uur van te voren. Ik hoorde vertellen dat men vroeger helemaal te water tot Antwerpen toe reizen kon, maar sedert drie schepen met man en muis verongelukt waren, had men de huidige schikking genomen.



De eerste trein komt aan in Antwerpen – 3 mei 1836.



Het schilderij voorstellend Theodoor Teichmann met het plan van het kanaal en de maquette van de sluis van Willebroek.

Ook de Zweedse mysticus Swedenborg doet zijn verhaal over zijn tocht, eerst van Rotterdam naar Antwerpen per boot en dan: des nachts vertrekt hij met de boot van Antwerpen naar Boom:

Daarna nam ik plaats in een grote trekschuyt veertig ellen lang en zes ellen breed, voorzien van schone plaatsen: cabines, keukens en andere plaatsen, en vooraan, ene tent waar men kon neerzitten. Wij veranderden driemaal van deze trekschuyten die door twee paarden getrokken werden. Het was een aangename en plezierige reis. Langs beide zijden stonden schone bomen. De mensen waren heel vriendelijk.

Het kanaal Brussel-Willebroek werd verscheidene malen verbreed en aangepast. Op een anoniem schilderij uit de 19de eeuw (private collectie) werd Theodoor Teichmann, ingenieur-politicus tussen 1817-1830, afgebeeld met een plan voor de verbreding van de sluis van Willebroek. In 1825 ijverde hij als Hoofdingenieur bij de Waterstaat voor de verbreding van het kanaal. Rechts op het schilderij staat een maquette van de sluis, links is een beeld van het kanaal geschilderd. Het zou interessant zijn moest deze maquette, indien ze nog bestaat, teruggevonden kon worden. Een slotbevinding van de reizigers was dat je in een trekschuit alle gelegenheid had om de taal en de bekommernissen van de medemensen te leren kennen, alsook hun karakter en gewoonten.

De Ruimschoots Juli 2020
Kraaiennest wzw De Vrienden vaqn het Nationaal Scheepvaartmuseum

Inséré 04/05/22 NIEUWS NOUVELLES Enlevé 04/06/22

Feasibility Study Finds LNG Carriers Beat Tankers When It Comes to Carbon Capture and Storage

By : Mike Schuler

A feasibility study into shipping's use of carbon capture and storage (CCS) technology shows that the LNG sector is currently better suited than tankers to benefit from the use of CCS, although tankers could also benefit as costs come down. The study was conducted as part a partnership between tanker company Stena Bulk and the Oil and Gas Climate Initiative (OGCI) and aimed at exploring the potential of capturing carbon from the exhaust of large ships as the shipping industry races to decarbonize.



The 2008 built 260928 cubic meters Liquid Gas tanker **UMM SLAL** Stena Bulk provided data from three vessels of different types in its fleet, specifically a medium range (MR) oil/chemical tanker and a Suezmax crude oil tanker currently running on heavy fuel oil (HFO), and an LNG carrier fueled by LNG. Data collected included information on deck space, fuel use, and the availability of heat and energy in the exhaust stream, among other considerations.

The findings showed that the LNG carrier offered the most straightforward path to implementing viable CCS because it had the right mix of onboard infrastructure, while the Suezmax and MR tankers presented more technical challenges to implementing a CCS system. That's not to say tankers don't have the potential to successfully use CCS technology. The study showed that carbon capture and storage is also technically feasible on a large tanker (in this case the suezmax benefitted over the MR tanker), but the biggest barrier is the cost of installation and operation.

Upfront capex requirements of installing storage tanks, compressors, and other equipment create a barrier to entry, while operation expenses also increase because of the energy requirements for using a CCS system effectively. However, the study found that these costs could be substantially reduced if the engine was adapted for compatibility with carbon capture and storage. The study concluded that while costs were likely to be a hurdle to deployment of CCS in the near and medium term, the technology could be a viable long-term option to meeting decarbonization targets as technology improves and costs come down.

Commodity prices for captured carbon dioxide could also potentially offset some the costs to install and operate. "We think that it's right that the industry is honest about the

challenges it faces from a technical and commercial perspective on the pathway to decarbonisation,” said Erik Hånell, President and CEO of Stena Bulk. “This study proves once again that there is no silver bullet solution to meet the IMO’s climate targets, and that we must promote and adopt a wide variety of proven and commercially sensible solutions if we are to successfully decarbonise.” Dr. Michael Traver, Transport Workstream Chair for the Oil and Gas Climate Initiative, said: “Carbon capture and storage is expected to play a key role in meeting the ambitions of the Paris Agreement and is a familiar process for many of the member companies of OGCI. Extending and adapting the technology to marine vessels poses unique challenges, but also represents a great opportunity to reduce emissions from a difficult to abate sector within transportation. Our partnership with Stena Bulk has been a great example of the type of cross-industry collaboration that will be necessary to meet the challenges we face.”

Source :gCaptain

Inséré 05/05/22 NIEUWS NOUVELLES Enlevé 05/06/22

BIMCO launches new contract for employment of security escort vessels

BIMCO’s Documentary Committee has approved a new standard contract for security escort vessels (SEVs). The standard is a balanced contractual framework for SEVs that accompany merchant ships in high threat areas such as the Gulf of Guinea which has recently seen a rise in piracy activity as the dry season has begun, according to BIMCO’s release.

The new contract is dubbed SEV-GUARDCON because it is based on BIMCO’s GUARDCON contract for the employment of security guards on board ships.

“The escort vessel’s capabilities, and what should happen if the vessel does not arrive at the rendezvous point as agreed, are key issues for shipowners and operators trading in high threat areas. SEV-GUARDCON addresses these and other aspects to consider when transiting areas such as the Gulf of Guinea,” says Dan Carr, Deputy General Counsel, Stolt-Nielsen, who chaired the work of the project team.

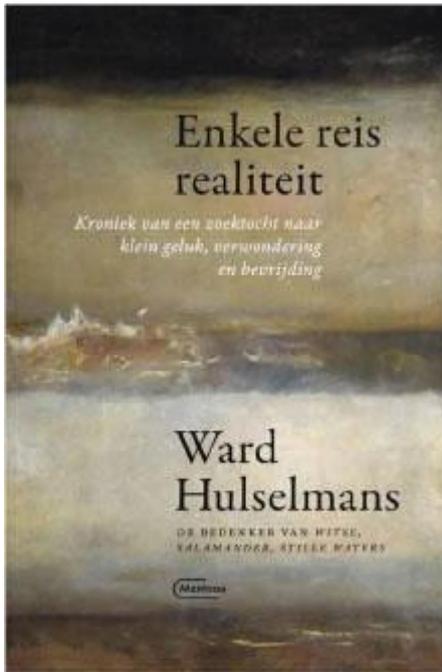
SEV-GUARDCON has been drafted specifically for cross-border transits where an SEV is needed to accompany the owner’s vessel through the Exclusive Economic Zone (EEZ) or territorial waters of more than one state. The structure mirrors GUARDCON wherever possible to ensure familiarity, and the insurance provisions have been kept as close as possible to the original GUARDCON wording. The liabilities and indemnities provisions reflect that SEV-GUARDCON covers services of an independently operated SEV as opposed to a security team carried on board the merchant ship.

The project team consisted of representative shipowners and operators, private maritime security companies and maritime risk consultants, P&I Clubs, and marine insurance and legal experts, several of whom also participated in the development of the original GUARDCON contract. It will soon be available on BIMCO’s secure contract editing system, SmartCon, as well as in a sample version on the BIMCO website accompanied by explanatory notes.

Source : Portnews

Inséré 05/04/21 BOEKEN LIVRES BOOKS Enlevé 05/06/22

Boekennieuws



Cptn Zeppos, lid van Watererfgoed Vlaanderen, heeft maar één missie: Mensen de kans geven om hun droom waar te maken door te reizen aan boord van een vrachtschip.

Eén van de passagiers, **Ward Hulselmans** schreef het boek: "**Enkele reis realiteit**".

Zijn avonturen als passagier aan boord van de Elbfeeder (Antwerpen - Dublin - Cork - Antwerpen) en de MSC Alessia (Antwerpen - Sines - Piraeus - Istanboel) schreef hij neer in zijn dagboeken, die nadien belandden in dit nieuwe boek.

Ward was beroepsjournalist en scenarist, en staat bekend voor zijn successeries Niet voor publikatie, Heterdaad, Stille Waters, Witse en Salamander. Voor de eerste keer stapte hij aan boord van een vrachtschip naar Ierland, vervolgens vaarde hij mee tot in Istanboel.

Bestel Ward's boek door 22,99 €/boek + verzendkosten binnen België €2,99 (verzending naar Nederland €4,50) over te maken op CptnZeppos rekeningnummer BE30 7340 4624 0111. Schrijf in de mededeling "Enkele Reis Realiteit + adres + telefoonnummer"

ISBN: 9789022337431

Na zijn eerste reis aan boord van een vrachtschip schreef Ward Hulselmans: "Ik leun op de reling en krijg langzaam het gevoel van totale vrijheid..."

Inséré 06/05/22 DOSSIER Enlevé 06/06/22

The 'Dark Forces' Surrounding The Captain's Lawyers In Mauritius Wakashio Oil Spill Ship Case (I)

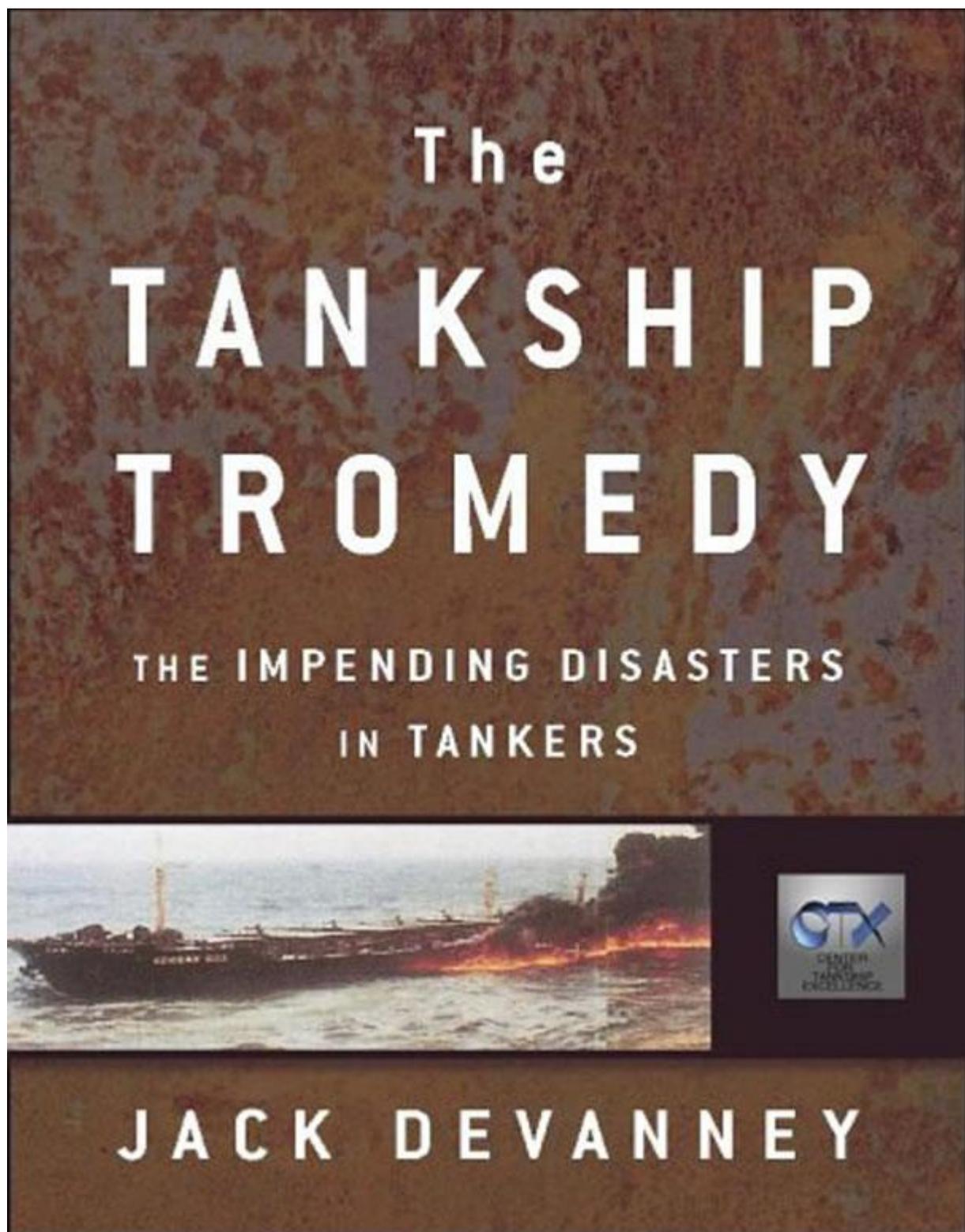


Sunil Kumar Nandeshwar, captain of the MV Wakashio, seen outside the Supreme Court of Mauritius in ... [+]

Maritime law is just like the ocean – full of turbulence and unexpected twists and turns. It has certainly been this way in the case of the large Japanese bulk carrier, the *Wakashio*, the ship at the center of the ongoing major oil spill response in Mauritius. A series of revelations in the local media by the former lawyer to the captain over the past few weeks, has started to raise eyebrows in Mauritius and around the world. For context, captains on large ocean-bound ships hold huge responsibility, but also bear intolerable risks. Most of the biggest risks actually lay far from the ocean, and in the law courts on land. In some of the biggest maritime cases in history, it has often been the captain of large vessels that have been positioned as scapegoats by the very shipping companies that employ them and earn billions of dollars annually for their loyal service.

Blaming the crew

'Blaming the crew' has been the go-to response for many ship owners, operators, maritime insurance firms, and 'flags of convenience' regulators, rather than addressing some of the bigger, systematic safety issues in the shipping world, that have gone unchecked for so long, such as the risks of single-hulled vessels.



Jack Devanney's 2006 classic book, The Tankship Tromedy, is essential reading to understand the ... [+]

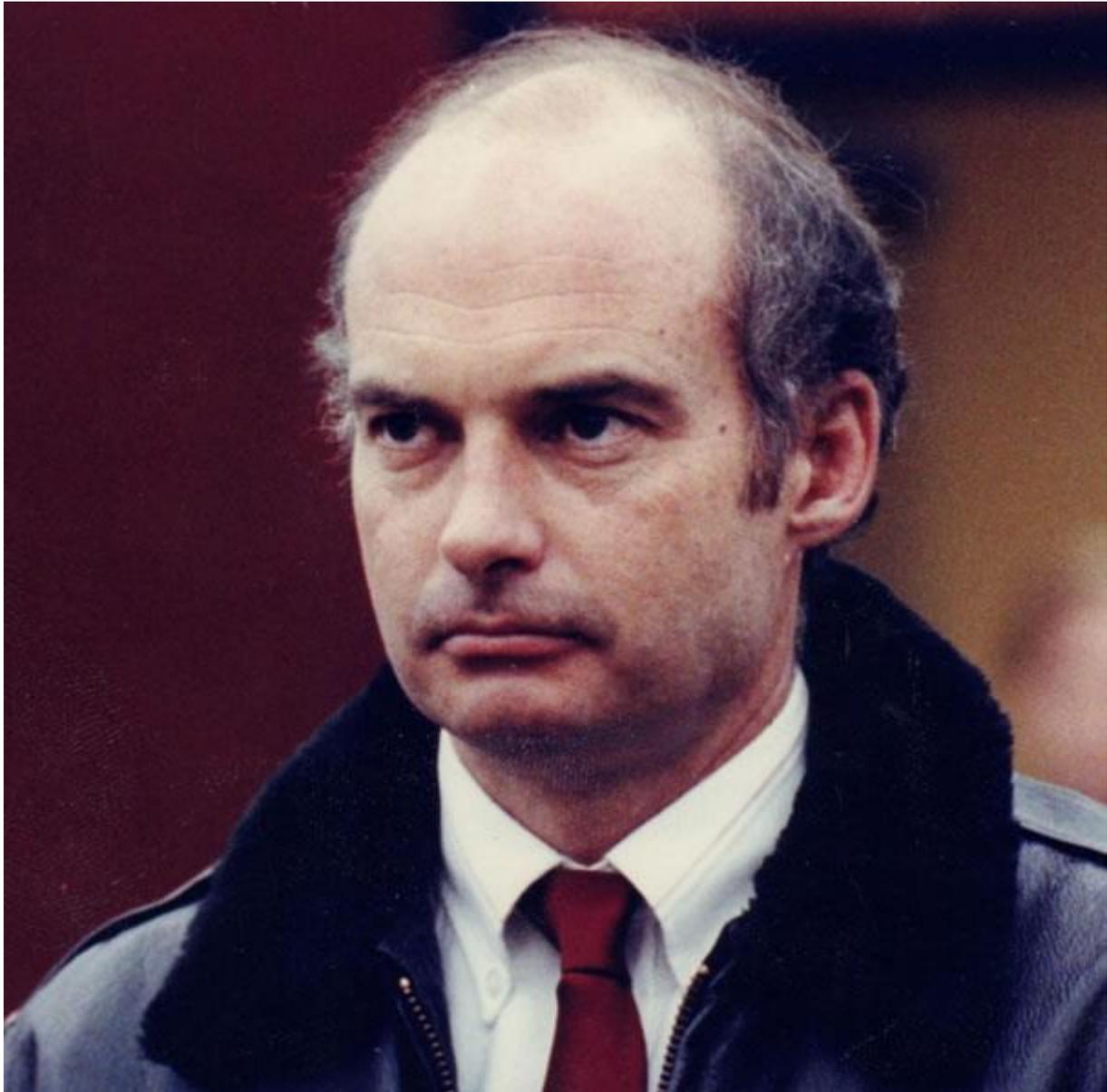
The phenomenon of 'blaming the crew' has been well documented in the iconic 2006 maritime accident book 'The Tankship Tromedy' authored by MIT Ocean Engineering Professor and famous oil tanker owner, Jack Devanney. Page 6 of his account goes into the classic response of many shipowners to blame the crew. It describes three reasons for this 1) crew errors are easier to recognize compared to poor ship design, poor maintenance, and poor enforcement of rules, 2) ship investigators are incentivized to only focus on the surface, operational issues rather

than the systemic issues underlying them, 3) blaming the crew is the easy way out to avoid identifying culpability of the ship owners, constructors or those responsible for ship maintenance. Some of the most high-profile maritime disaster cases entail the wrongful accusation of the captain and crew. Here are four prominent examples.

Exxon Valdez (Alaska, USA, 1989)



5 Apr 1989: Oil tanker Exxon Valdez in Alaska, Prince William Sound, after running aground on 24



Captain of the Exxon Valdez, Joseph Hazelwood, fought to clear his name from accusations. *Image ...* [\[+\]](#)

The Captain of the Exxon Valdez was accused of being drunk in the 1989 Alaska oil spill. He wasn't, and after a 12-month battle to clear his name, he still retains his captain's license.

According to the ITOPF, until the BP Deepwater Horizon incident in 2010, "The most expensive oil spill in history was the Exxon Valdez. Cleanup alone cost in the region of US \$2.5 billion and total costs (including fines, penalties and claims settlements) have, at times been estimated at as much as US \$7 billion."

Cosco Busan (San Francisco, USA, 2007)



13 Nov 2007: cargo ship Cosco Busan in San Francisco hit the Bay Bridge in fog, and a 90 foot gash

In the Cosco Busan oil spill in San Francisco in 2007, the pilot (who steers the ship in and out of harbors and is different from the captain) was initially accused of being under the influence of drugs, after an anonymous tip off. In fact, CVS the pharmacy was eventually sued by the Hong Kong owners for the wrongful issue of a cocktail prescription pharmaceuticals without sufficient warning, rather than the willful intent of the pilot to be under the influence of drugs.

MV New Carissa (Oregon, USA, 1999)



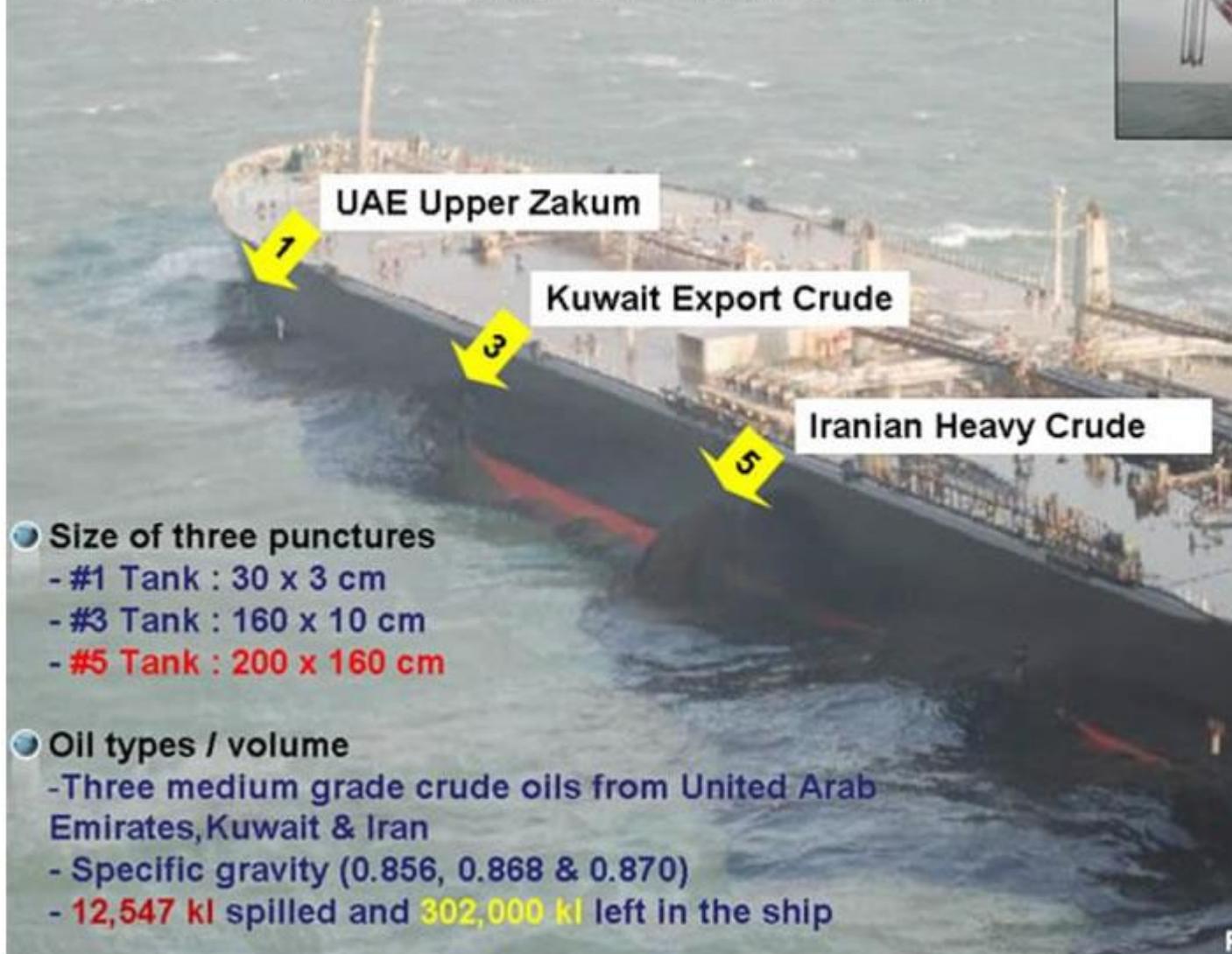
February 4, 1999: Panama-flagged, MV New Carissa, a 639-foot bulk carrier grounded in head seas off Oregon. The ship was carrying 150,000 tons of iron ore. The ship was damaged and sank in 1999. The ship was salvaged and the cargo was recovered. [a+]

In the case of the *MV New Carissa* off Oregon in 1999 (with many similar characteristics as the ongoing *Wakashio* incident in Mauritius), despite initial attempts to pin the blame of the grounding on the crew, there was no evidence found of criminal wrongdoing, and the crew was released without any charges.

Negligence was found against other parties, however.

MV Heibei Spirit (Daesan Port, South Korea, 2007)

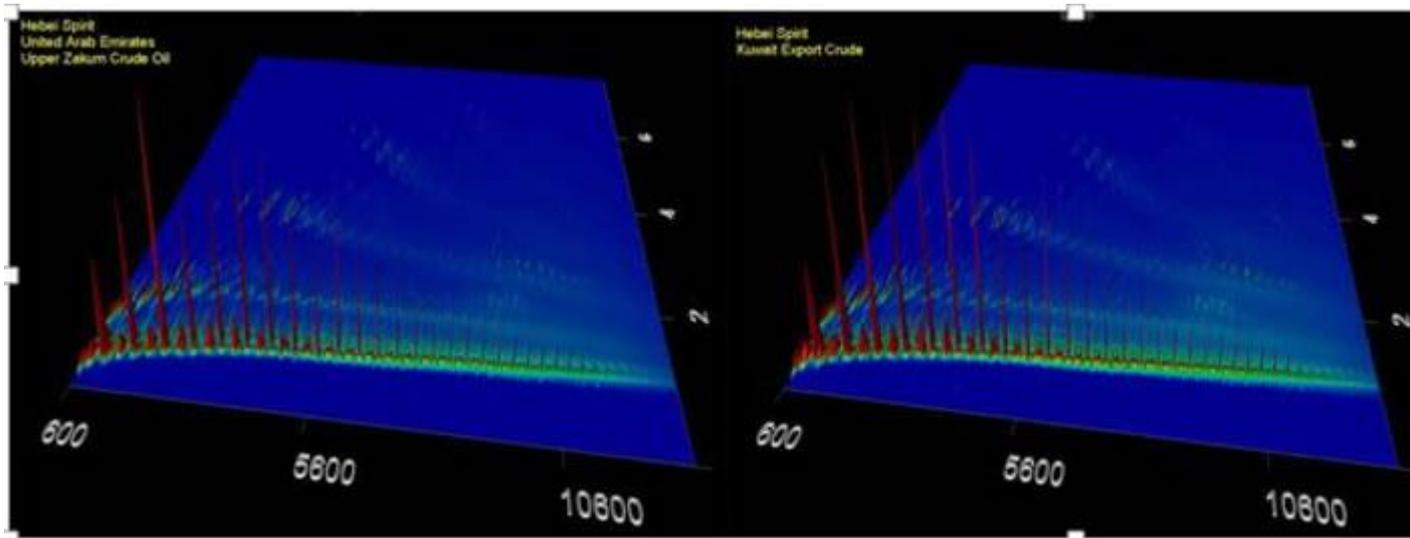
Types and volume of spilled oils



The Hebei Spirit had three types of crude oil, and was anchored when a loose crane hit it. Rather .

In 2007, Captain Jasprit Chawla of the *Hebei Spirit* was sentenced to jail in South Korea because a crane barge owned by Samsung broke loose and hit his ship which was at anchor. The crane barge captain was exonerated.

There was global outrage by almost every maritime union, and the International Transport Workers Federation organized protests in several cities to call on the UN shipping agency, the International Maritime Organization, to stop criminalizing captains. The IMO did not even issue a press release condemning the criminalizing of captains or crew and certainly did not take any action to prevent such workforce abuse from occurring again.



Oil fingerprinting of each of the three oils were completed within 10 days of the 2007 Hebei Spirit

All of this is useful context for the surprising turn of events that have occurred surrounding the legal case against the captain of the giant Japanese iron ore bulk carrier that spilled oil in Mauritius last month.

This has only now been revealed in a series of interviews by the former lawyer to the Captain of the *Wakashio* that has been prominently circulated through interviews in the local newspapers, on radio and television in Mauritius.

The 'dark forces' surrounding the Captain's lawyers



9 Aug 2020: oil gushing from the Wakashio onto the reefs of Mauritius. The Wakashio was carryin

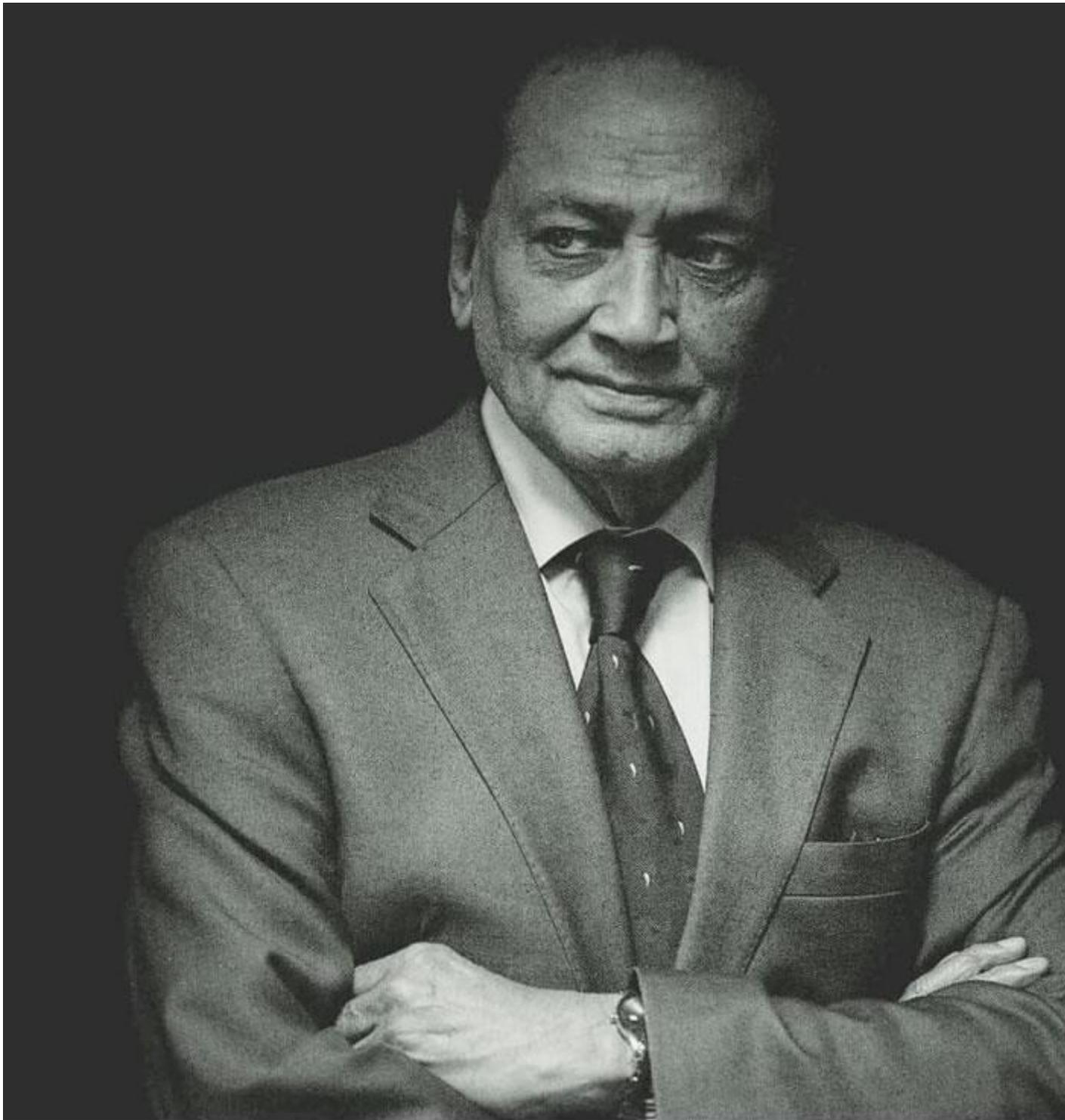
The captain of the *Wakashio*, 58-year-old Sunil Kumar Nandeshwar, was arrested by police on August 18. He was provisionally charged with “*unlawful interference with the operation of a property of a ship likely to endanger its safe navigation*” under articles 5(1) (b) (2) et (9) of the Mauritius Piracy and Maritime Violence Act. This charge carried with it a 60-year jail sentence.



Sunil Kumar Nandeshwar (L), the captain of the MV Wakashio leaves from the court after he and his

The family of the captain (mainly the captain’s wife, son and sister) as well as an association of ship captains, engaged one of the best and highest-profile legal teams in Mauritius. The lawyer leading the case defending the captain was Yousuf Mohamed, a Senior Council. As the oldest lawyer still-practicing in Mauritius, he is a well-known figure in legal circles nationally and internationally. He was a former Minister in the 1970s, an Ambassador to several countries and a Deputy Speaker in Parliament in the 1980s.

The wife of the captain, who is a judge in Indore, India, paid the 100,000 Mauritian Rupees (around \$3500) to secure his services.



Yousuf Mohamed is the oldest barrister still practicing law in Mauritius, and was a former Minister

Yousuf Mohamed's career spans 59 years since he was called to the bar in the UK before Mauritius even had independence. He has one of the longest legal careers in Mauritius and has been involved in some of the island's biggest cases, involving former Prime Ministers, Presidents, CEOs - cases that have defined Mauritius's history. His legal firm in Mauritius, MC Law Offices, are very well known.

Mauritius' legal system has the UK's Privy Council as the highest court of appeal, and has to take legal affairs seriously due to the importance of the country's large international finance sector that depends on this legal integrity.

To be Followed

Inséré 07/05/22 DOSSIER Enlevé 07/06/22

The 'Dark Forces' Surrounding The Captain's Lawyers In Mauritius Wakashio Oil Spill Ship Case (II)

The 'change of heart' by the captain



17 Aug 17, 2020, Wakashio in two parts near Blue Bay Marine Park.

Within six days of having one of the most prestigious legal teams having been appointed to the Captain of the Wakashio, Senior Counsel Yousuf Mohamed was asked to suddenly leave the case.

According to Mr Mohamed, something mysterious occurred in the evening of September 1 or in the morning of September 2 in the police cells of Mauritius where the captain was being held.

Mr Mohamed said that in a distinguished legal career spanning almost six decades, he has never experienced anything quite like this



Police officers on duty outside the Supreme Court in Port Louis, Mauritius, on day ten of the trial ..

Given the circumstances under which he was asked to leave the case, Yousuf Mohamed has described these as 'dark forces' that have now surrounded the legal case of the captain of the *Wakashio*.

According to the interview published in L'Express newspaper on September 12, the Captain is currently being represented by a lawyer from the *Wakashio's* insurance company and a lawyer from the vessel owner.

Yousuf Mohamed has given his account to the local media in Mauritius, and confirmed these accounts when contacted by Forbes.

The 12th September L'Express newspaper interview

Interview

M^e Yousuf Mohamed,
ex-avocat du capitaine du «Wakashio»

«C'EST SANS DOUTE LA PLUS ÉTRANGE AFFAIRE DE MA CARRIÈRE»

Il a provoqué un orage médiatique en parlant des «révélations» du capitaine du «Wakashio» avant que celui-ci ne décide de se passer de ses services. Dans cet entretien, M^e Yousuf Mohamed déballe tous ses échanges avec le capitaine, sa famille et ses amis...

Propos recueillis par
Axel CHENNEY

■ **Du haut de vos 87 ans, qu'est-ce que vous faites au-devant de l'actualité ? C'est si difficile de prendre sa retraite ?**

Je suis en parfaite santé. Ma relève est assurée avec mes deux fils avocats. Mais même après 59 ans au barreau, je me plais toujours à exercer et à aider les gens à obtenir justice. Quand Dieu le décidera, je m'arrêterai.

■ **Vous n'avez aucun souci à vous faire. L'adrénaline de votre mésaventure avec le capitaine du «Wakashio» vient d'ajouter 10 ans à votre vie.**

C'est Dieu qui décide.

■ **Je préfère qu'on parle des hommes. Le capitaine du «Wakashio» par exemple. Comment vos services ont-ils été retenus ?**

Mes services ont été retenus par la sœur, l'épouse et le fils du capitaine Sunil Kumar Nandeshwar. Ils vivent à Indore en Inde. Et le capitaine du «Wakashio» est aussi membre d'une association de capitaines qui soutiennent la famille. Vous n'imaginiez pas le nombre de capitaines de navires dans le monde qui, avec la famille et moi, sont sur un groupe WhatsApp. Ils m'ont d'abord contacté par e-mail pour me dire qu'ils voulaient retenir mes services. J'ai accepté.

■ **Racontez-nous votre première rencontre avec le capitaine.**

C'était le 26 août au Moka Detention Centre. Je lui ai montré les messages de sa sœur, de son épouse et ses collègues capitaines sur mon portable après que j'ai demandé aux policiers la permission d'entrer avec mon portable. Quand le capitaine a vu ces messages, il a commencé à me parler.

■ **Comment vous l'avez senti à ce moment-là ?**

Troublé et mal à l'aise. Il m'a informé qu'il a déjà donné un statement à l'ACP Budhoo et l'ASP Koolil du CCID. Je peux tout vous raconter à présent puisqu'il n'y a plus de *legal privilege*, étant donné que je ne suis plus son avocat et que la police m'a informé que *privilege is waived*.

■ **Comment l'accident s'est-il donc produit selon votre ex-client ?**

Attendez. (Il jonne laborieusement dans ses dossiers et retourne une note manuscrite.)

■ **C'est quoi ?**

Ce sont les notes que j'ai prises lors de ma rencontre avec le capitaine.

■ **Que disent ces notes ?**

Le capitaine m'a raconté les circonstances de l'accident. Il y avait un anniversaire à bord ce jour-là. Il m'a expliqué que lui comme capitaine il n'était pas obligé de rester sur la passerelle. Il y a des *duty officers* qui se relayent toutes les quatre heures. Il pouvait rester avec les autres puisqu'il avait confié la responsabilité du bateau à son second, un certain Tilkartha. L'instruction qu'il lui transmet est la suivante : «*Il faut garder le navire à 5 miles des côtes de Maurice.*» Voilà ce qu'il m'a dit. «*Le Chief Officer n'a pas suivi mes instructions. Le bateau est arrivé à un mile des côtes.*» Comment vous expliquez cela, lui ai-je demandé. Il m'a dit que «*probably he did not do proper monitoring or he was busy trying to catch mobile signals.*»

■ **Donc la recherche alléguée de signal téléphonique, c'est juste une hypothèse du capitaine ?**

Oui. Le capitaine utilise le mot «*probably*». C'est écrit dans mes notes. Le capitaine me dit aussi «*there was no contact at all with Coast Guard prior to grounding.*» (Il poursuit la lecture de ses notes). «*The Coast Guard was contacted by them at about 20 hours to report the grounding.*» (Il lève la tête pour nous regarder.) Ce ne sont pas les garde-côtes qui ont appelé le bateau. (Il se remet à lire.) «*The reply of Coast Guards was: don't worry. We are monitoring and keeping watch. We kept communication with Coast Guards through VHF. Nobody assisted us. Nobody proposed to board. On the 28th of July medical people boarded our ship to test us for Covid-19.*» Et le 31 juillet l'équipe de SMIT Salvage a pris possession du bateau.

Je lui ai demandé si des bateaux hormis ceux de SMIT et celui qui avait transporté l'équipe médicale avaient approché son navire. Question que je pose après avoir vu les images satellites recueillies par M. Laurette.

Il a nié. Voilà c'est tout ce que je sais.

■ **Attendez, et la cargaison alors ?**

J'ai demandé au capitaine ce que son bateau transportait. Il n'a pas répondu.

■ **Comment ça ?**

C'est la seule question à laquelle il n'a pas répondu. Pour moi, la question était pertinente en fonction des rumeurs et hypothèses qui étaient déjà du domaine public. Mais il n'a pas répondu.

■ **Vous voulez dire que les soi-disant révélations du capitaine ne font pas mention de la cargaison ?**

Sans que je ne dise quoi que ce soit, on a cru qu'il m'avait avoué des choses au sujet de la cargaison. J'ai juste dit qu'il m'a fait des révélations. Et je viens de tout vous raconter.

■ **Mais vous auriez pu démentir, empêcher l'emballement médiatique...**

Attendez. Quand il y a eu cet emballement, j'étais toujours l'avocat du capitaine. Je ne pouvais donner aucun détail sans compromettre le privilège du client qui se confie à son avocat. Aujourd'hui, ce privilège n'existe plus. Je vous raconte tout dans les détails. Et puis, je ne sais pas si vous m'avez bien entendu. Je vous répète que dans les faits, la question au sujet de la cargaison, c'est la seule à laquelle le capitaine n'a pas répondu.

■ **Vous en avez vu des vertes et des pas mûres durant votre longue carrière. Que vous dit votre instinct sur ce silence ?**

À mon tour de garder le silence.

■ **Pourquoi vous n'êtes plus son avocat ?**

C'est le client qui décide. Sa famille insiste toujours auprès de moi pour que je le représente. Mais lui ne veut pas. Je sais que certaines personnes ici lui ont montré des vidéos de Shaleel (NiDR son fils, whip de l'opposition). La famille me l'a dit. Cela en soi éveille la méfiance. C'est malsain.

Aujourd'hui, le capitaine est représenté par l'avocat de l'assureur et l'avocat du propriétaire du navire. Le capitaine n'a pas compris que son intérêt est différent de, voire en conflit avec, celui de ces deux autres parties. Mais je n'y peux rien. La famille m'avait transféré Rs 100 000 plus la TVA. Je lui ai retourné son argent. Vous ne le savez peut-être pas, mais l'épouse du capitaine est une juge en Inde. (Il sort son téléphone pour montrer le groupe WhatsApp avec les autres capitaines et la famille, nous lui montrant chronologiquement et il s'arrête subitement.)

■ **Qu'est-ce qu'il y a ?**

Regardez ce message où je fais une



confiance aux amis et à la famille. Je leur raconte, et c'est vrai, appel téléphonique d'un homme comme un membre l'équipe monsieur Pritam Singh. Il me demande s'il pouvait dire que le capitaine était ivre. Et je fais à la famille avec la réponse à la personne qui m'a appelé. *Mr. Pritam to be about the captain* avait le droit d'être en pause, et j'ai expliqué cela.

■ **Au final, votre histoire c'est une «storm in a teacup» ?**

Non ! Il y a le mystère du ton de la cargaison. Il y a le mystère sur le laxisme des autorités à la mystère des bateaux qui restent en mer. *Wakashio* qui reste entier alors que les autres ont coulé. Et il y a le mystère auto-voient pas, malgré l'insistance que je sois l'avocat du capitaine. C'est une des affaires les plus étranges que j'ai jamais vues. Et Dieu sait que j'en ai vu des mystères.

■ **Du regard du peuple, vous déjà vu une affaire d'ampleur dans l'éveil du peuple ?**

Non. Je pense que le peuple ne s'en rend pas compte. J'étais à la marche de la marine de drone par la suite. Mais constitutionnellement je respecte la loi de mon pays. Malheureusement, ce gouvernement pour les quatre prochaines années ne fera rien.

■ **Une analyse rapide de la DPP de «discontinue» la cution- de Bruneau Laur**

Une décision logique. On ne peut pas épée de Damoclès citoyens sans avoir entendu l'avis. Je pense que tout le monde est d'accord. *for the time being*. N. Teeluckdarry n'ont pas à gratter un peu vite en besogne, mais défait. Au contraire, grâce à la décision, la police devra interroger qui ne sont pas encore sortis de la zone. Le DPP verra à la fin. (L'entretien prend fin. M. Yousuf Mohamed nous remet son portable.)

Tenez, ce sont mes coordonnées familiales et les amis du capitaine vous intéressent... (à tour sur le

The 12 September Interview in the largest Mauritian newspaper, L'Express, contained explosive ... [+]

According to Mr Mohamed, on August 26, he met with the Captain of the Wakashio at The Police Detention Center in Moka, central Mauritius. The captain spoke English and as published in the interview in the L'Express newspaper, revealed that Captain Sunil Nandeshwar had already given a statement to the Mauritian police, an Assistant Police Commissioner Budhoo and an Assistant Police Superintendent Kokil of the CCID, the Central Criminal Investigation Department of the Mauritius Police.

When inquiring about the circumstances that led to the grounding of the vessel, the captain revealed that he did not have to stay on the bridge, as he had duty officers that changed shifts every 4 hours. The captain had put the responsibility of the boat onto the second in command, a certain Tilkartna, according to the detailed interview transcript published in the L'Express newspaper.

Maritime news site, gCaptain describes the Chief Officer as Sri Lankan Tilak Ratna Suboda, who is also facing similar charges as the Captain.

In the interview in L'Express, Mr Mohamed shares the Captain's account about the various interactions the Captain had with the Mauritian Coastguard through VHF radio, and then the team from SMIT Salvage that took possession of the Wakashio on July 31.

There appears to be four areas where 'dark forces' could potentially be at work.

1. The mysterious phone calls



Captain Sunil Nandeshwar and his Sri Lankan Chief Officer, Tilak Ratna Suboda in the Mauritius ...

Things became a little odd when after the initial meeting with the Captain on August 26. Mr Mohamed received a surprising phone call, as he revealed in an interview with the largest newspaper in Mauritius, L'Express, published on September 12.

"I received a telephone call from a man saying he was a member of the crew, a certain Mr. Pritam Singh. He called me to ask if he could tell the police that the captain was drunk. And I told the captain's family the same answer I gave to the person who called me: "I cannot tell Mr Pritam to lie about the captain drinking."

The captain had the right to be drunk since he was on a break, and I explained that to the family."

Mr Mohamed did not think any more about this phone call as he had already made the point that there were two watch duty officers on the bridge, under the supervision of the second in command, and that the captain was on a break.

He was focussed on the next scheduled appearance of Captain Nandeshwar in Court six days later on September 1.

2. Changing lawyers: the odd events between September 1 and 2



The Sir Gaetan tug sunk overnight on 31 August, and the search and rescue for the missing tugboat

The day before the court appearance, the entire country of Mauritius was shocked by the overturning of the tugboat, the *Sir Gaetan Duval*, and the loss of four lives on August 31. There had been fears of a second oil spill at the time, as this tug boat was towing back an oil barge, the *L'Ami Constant*.

While the media attention was on the sunk tugboat and the search for the missing tugboat captain, Mr Mohamed received another strange phone call on the very morning of the Captain's scheduled court appearance on September 1.

This time, it was from the police CCID officer who had taken the captain's original statement, saying that the Captain no longer wanted Mr Mohamed's legal representation. Mr Mohamed found this surprising and was insistent on meeting with his client. He came to the police cells where Captain Nandeshwar was being held and showed the Captain the WhatsApp exchanges with the Captain's wife and family, and the captain agreed to have Mr Mohamed represent him in court. This was all recounted on national TV in Mauritius.

At the Supreme Court of Mauritius on Tuesday September 1, Mr Mohamed and the Captain's legal team put forth a motion to drop the provisional charges against the

captain. Mr Mohamed explained that the reason the provisional charges should be dropped was because there was no evidence that there had been a breach of the Piracy Act and so the captain should be released on bail. (This was revealed on the same video broadcast on national television in Mauritius at 25 mins). Mr Mohamed argued that this approach was in the best interests and defense for the captain.

That evening Captain Sunil Nandeshwar was returned to his police cell and Mr Mohamed and the legal team returned home. They had agreed to meet the following morning between 9.30am and 10am to resume the hearing.

Overnight, Yousuf Mohamed had contacted the sister of the Captain to recount the day's events. The sister insisted that Mr Mohamed's team continue to represent the Captain and she called her brother that evening to confirm this, as explained by Mr Mohamed in the interview below (spoken in Mauritian Creole).

2 September 2, 2020

The next day, on September 2, the legal team arrived at the police detention center to continue the inquiry. Overnight, Mr Mohamed had been exchanging emails with the Captain's sister and had emails dated that very morning which insisted that Mr Mohamed make the strongest possible representations in the case.

According to the interview with Mr Mohamed broadcast on Top FM in Mauritius, the legal team and the captain met at 10am on Wednesday September 2 at the Mauritian Police barracks, called the Central Criminal Investigation Department (CCID). Mr Mohamed had a printout of his sister's email that very morning asking him to continue representing Captain Nandeshwar.

To everyone's surprise, Captain Nandeshwar turned around and said he did not want the services of Mr Mohamed, one of the best lawyers in Mauritius. The account of this strange episode was revealed on national TV in Mauritius (and can be seen here in French around the 12th minute).

Mr Mohamed described this as 'dark forces' at work surrounding Captain Nandeshwar to have had such a change of heart overnight. The legal team immediately contacted the captain's wife and sister. They were adamant that they wanted Mr Mohamed to continue. But as Mr Mohamed explained, the accused was the client, and once he had expressed his wish not to be represented, Mr Mohamed had no choice but to leave the case. Before leaving the case, Mr Mohamed did say in English to the captain (seen at 13 mins 45 secs in the televised interview), "Your interests are not the same as those of the owner of the ship or those of the insurance company."

3. Lawyer's advice to the Captain



24 Aug 2020: the Wakashio was deliberately sunk on 24 August at an undisclosed location

As the Captain is no longer the client of Mr Mohamed, the police explained that legal privilege was waived and he could reveal other aspects of the case, for example the legal strategy they had planned.

Mr Mohamed mentioned that the captain spoke English, and he was not on Bridge Watch as others were on duty on bridge watch, as per their duty shift arrangement.

Mr Mohamed also urged the captain to say the truth so that he could be seen as a cooperating witness by Mauritius' Director of Public Prosecutions, rather than as an accused criminal party. (15 min 45 secs)

This would then have fit in well with the legal teams' views that the provisional charges against the captain should be dropped as there was no breach of the Mauritius Piracy Act and the captain should be released on bail. (25 mins)

Given this legal strategy offered the best protection and defense for his client, Captain Nandeshwar, Mr Mohamed wondered what an alternative legal team could potentially offer that could trump such an approach.

4. Questioning the scope of Wakashio inquiry



An internal view of Court room at the Supreme Court in Port Louis, Mauritius.

In the televised interview, Mr Mohamed also went further to express his surprise at how the investigation into the *Wakashio* was being conducted. In Mauritius, there are two types of inquiries, a Court of Investigation and a Commission of Inquiry.

- The Court of Investigation normally has a narrower mandate with much weaker powers.
 - The Commission of Inquiry has a broader scope, more power to summon all witnesses, and more protection for witnesses who testify.
- Given that the events of the *Wakashio* has caused the worst environmental disaster in Mauritius, national protests of over 100,000, the deaths of over 50 whales and dolphins and the loss of four Mauritius crew in a *Wakashio* salvage tugboat that overturned, a wide inquiry is needed to ensure all relevant points are covered.

The Court of Investigation is clearly insufficient.

This sentiment has been echoed by all the leaders of the main opposition parties, as well as former Presidents. Why would a full Commission of Inquiry not be held?

The increasingly mysterious case of the *Wakashio*



12 Sep 2020: large crowds of protesters wave Mauritius' national flags and signs as they take part

The events surrounding the *Wakashio* continue to get more and more mysterious. At face value, the grounding of the *Wakashio* appeared to be a large industrial tragedy. However, as the actions and responses to this incident become more and more bizarre, and take place under extreme secrecy, many are wondering whether there is more than meets the eye to this incident. Perhaps these actions themselves, more so than the initial oil spill, have now become the most worrisome of all.

Inséré 09/05/22 NIEUWS NOUVELLES Enlevé 09/06/22

Seafarer lives don't need to be risked during lifeboat drills

Seafarers are dying needlessly in lifeboat accidents when maritime legislation doesn't actually require vessels to be manned during drills. InterManager, the international trade association for ship and crew managers, is raising awareness of this fact by highlighting a legislative change which means that it is not necessary for crew to be onboard when lifeboats are tested.

SOLAS regulation III/19.3.3.3 requires each lifeboat to be launched at least once every three months during an abandon ship drill, and manoeuvred in the water by its assigned operating crew. However, the regulation, whilst requiring each lifeboat to be manoeuvred in the water by its assigned operating crew, does not actually require that crew to be on board when the lifeboat is launched.

Many of the lifeboat fatalities have occurred during launch of the lifeboats, often due to problems with the hooks.

In 2009 the International Maritime Organization's (IMO) Maritime Safety Committee, agreed that the assigned operating crew should not be required to be on board lifeboats during launching, unless the Master, within the authority conferred to him/her by paragraph 5.5 of the ISM Code, considers it necessary, taking into account all safety aspects.

Captain Kuba Szymanski, InterManager Secretary General, said: "This is an extremely important change which seems to have been missed by some ship operators and is still included in some Shipboard / Safety Management Systems. To prevent any further loss of life in this way we are raising awareness of the fact that seafarers are not required to be in the lifeboat when launching during drills."

InterManager collates figures on lifeboat accidents on behalf of the maritime community and to assist in its role as a member of the International Lifeboat Group, which aims to reduce lifeboat accidents and deaths.

Since 1981 there have been 419 deaths involving lifeboats, 346 serious injuries and 116 minor injuries.

Capt Szymanski commented: "It's important that everyone involved, particularly Port State Control officers, understand and apply this regulation correctly. The maritime community must do all we can to ensure the safety of seafarers."

Inséré 11/05/22 DOSSIER Enlevé 11/06/22

Crews Are Abandoned on Ships in Record Numbers Without Pay, Food or a Way Home

Failing companies ditch vessels too expensive to repair or too difficult to sell, leaving behind cargo-ship castaways trapped in ports or offshore

By Drew Hinshaw and Joe Parkinson

An engineer stuck on a cargo ship abandoned in a Black Sea port has waited four years to get paid and go home. Off the coast of Somalia, a crew awaiting pay languishes on a pirate-trawled stretch of the Indian Ocean while their ship slowly takes on water. Another 14 seafarers, stuck on a cargo ship off the coast of Iran, have run out of food and fuel. Some contemplated suicide.



Abullah Dahha, captain of the *MV Ali Bey*, in the Constanta port in Romania. "We cannot survive here," said an engineer aboard the **MV Aizdihar**, abandoned off the Iranian port city of Bandar Abbas. "Please help us." He spoke via video earlier this year, his face drawn.

The \$14 trillion shipping industry, responsible for 90% of world trade, has left in its wake what appears to be a record number of cargo-ship castaways. Abandonment cases are counted when shipowners fail to pay crews two or more months in wages or don't cover the cost to send crew members home, according to the International Maritime Organization, a United Nations agency. Last year, the number of such cases reported to the agency more than doubled to 85 from 40 in 2019. This year is on track to be worse.

More than 1,000 seafarers are currently abandoned on container ships and bulk carriers, according to estimates by the International Transport Workers' Federation, a labor union. The true toll is likely higher because many crew members are reluctant to speak out for fear of being blacklisted, according to interviews with seafarers on abandoned vessels, shipowners, agents, maritime organizations and union officials. Mohamed Arrachedi, the union's Middle East coordinator, said he wakes up to dozens of WhatsApp messages from distraught sailors around the world: "It's a global humanitarian crisis."

In the United Arab Emirates, one shipping company abandoned seven container ships in recent months, leaving behind dozens of crew members, each owed a year's wages. A five-man crew marooned next to a Dubai tourist resort, living off little more than rice for 10 months, recently ended a four-year ordeal. Last year, a mostly Egyptian crew was abandoned in Sudan. The ship was then sold and manned by a mostly Sudanese crew who also were abandoned in Egypt. Three of them are still aboard, floating off the Suez Canal in their ninth month without pay. The surge in cases prompted three of the world's largest seafaring nations—China, Indonesia and the Philippines—to propose in August the establishment of a seafarers' mutual emergency fund to help abandoned crews.

Trade disruptions caused by the pandemic and the nature of the competitive, lightly regulated global shipping industry has helped drive the increase in the number of stranded sailors. Industry consolidation has yielded a half dozen shipping firms that ferry a majority of the world's containers, reaping record profits from ocean freight's best-ever quarter in the final three months of 2020, according to New York-based investment manager, Blue Alpha Capital. These firms have driven out competitors helming smaller, more rundown ships. Struggling companies are often one delay or cancellation away from foundering. When debts pile up, or the cost of repairs becomes too high, some firms choose to abandon a ship or sell it for scrap.

Completing a sale can take years in normal times. Pandemic-era travel restrictions have made it even harder, creating barriers for buyers, bankers, inspectors or court officials to visit ships ahead of transactions. When shipping companies run out of money, crew members often end up with nothing, except a derelict ship to squat on. Some governments

require sailors to remain aboard as guarantors until shipowners pay port authorities for berth fees and other charges. More often, sailors refuse to disembark, convinced they will never recoup months or years of lost wages if they leave. Seafarers stuck on board generally borrow money from friends and family to feed themselves and crewmates. Many say they will stay put until the ship is sold for scrap, which can take years, rather than go home empty-handed. Under the Maritime Labour Convention, a U.N.-backed treaty in effect since 2013, cargo-ship owners are required to hold insurance to care for abandoned crews. Many Middle Eastern nations didn't sign the treaty and don't enforce its rules, allowing their coastlines to become graveyards for dumped ships.

In Egypt's Suez anchorage, at the mouth of one of the world's busiest shipping lanes, several sailors have been trapped aboard a vessel for years. **Vehbi Kara**, the 56 year-old Turkish captain of the **MV KENAN METE**, was detained for a year in Suez while Egyptian authorities and the ship's owner tussled over unpaid debts. He was repatriated in July. Nearby, Syrian sailor Mohammad Aisha spent four years abandoned on the MV **AMAN** before he was allowed to disembark in April.

The crew of the **EVER GIVEN**, which clogged the canal for six days in March were held for four months aboard the cargo ship, until its owners reached a multimillion-dollar compensation deal with Egyptian authorities for its release.

'It's a prison'

At the core of the problem is the opaque manner the shipping industry polices itself. Shipowners hold primary responsibility for the welfare and well-being of seafarers, according to the IMO, but they face few consequences across much of the world's oceans for abandoning one vessel after the next.

In 2016, the mostly Syrian crew of the cargo ship Lady Didem was abandoned after not being paid for a year. The seven sailors spent four months docked in Greece, borrowing from their captain, Wessam Alhamoud, to buy food and water. The men sent WhatsApp messages to the ship's Turkish manager, Mustafa Demirel. The ship was sold the following year. After getting paid, the crew left. Mr. Demirel said the crew were troublesome employees who didn't go along with his arrangements, under which he would have paid them once they left the vessel. He blamed sanctions on Syria's banking system, but declined to explain further. Last year, another crew aboard a vessel managed by Mr. Demirel—the **MV ALI BEY**—was abandoned in Romania after inspectors and shipping agents at the Constanta port noticed that they didn't hold proper contracts and that some hadn't been paid in more than a year. Since then, four crew members have remained on board to await their pay, relying at times on a small propane camp stove for heat, as well as intermittent electricity. The crew has twice agreed on a payment plan with the owner, they said, but most of the money never arrived. The dispute has gone to a Romanian court, which is considering whether to transfer the case to Panama, where the ship is registered. The crew fear that giving up to head home could cost them nearly \$200,000 in claimed wages.



To pass the time, crew members play cards and throw chicken bones to stray dogs near the berth. They sit on the steps of a nearby duty-free shop to stare past the port's metal fence to watch the coming and goings of pedestrians. Mostly, they sleep, lying in bed deep into the afternoon. "We're living inside iron chains. It's a prison," said Capt. Abullah Dahha, who showed WhatsApp messages pestering Mr. Demirel, the ship manager. "He wants to break us." The crew should leave the ship and let a court settle the dispute, Mr. Demirel said. The countries where ships are registered, called flag states, are meant to ensure shipowners look after seafarers and their vessels. Yet many don't, said David Hammond, founder of the U.K.-based Human Rights at Sea advocacy group. Countries are mandated to verify that ships flying their flags pay seafarers on time, provide provisions and repatriate them at the end of contracts.

Source : The Wallstreet journal

Inséré 13/05/22 HISTORIEK HISTORIQUE Enlevé 13/06/22

Bearings Straight—An Introduction

Mariners share two fears: bad weather and getting lost. Their deep respect for the Mercator projection reflects the map's value for plotting an easily followed course that can be marked off with a straightedge and converted to a bearing with a protractor similar to the semi-circular plastic scales fourth graders use to measure angles. In a less direct way, the Mercator map also addresses the sailor's fear of storms by providing a reliable base for plotting meteorological data for tropical regions. But that's another story.

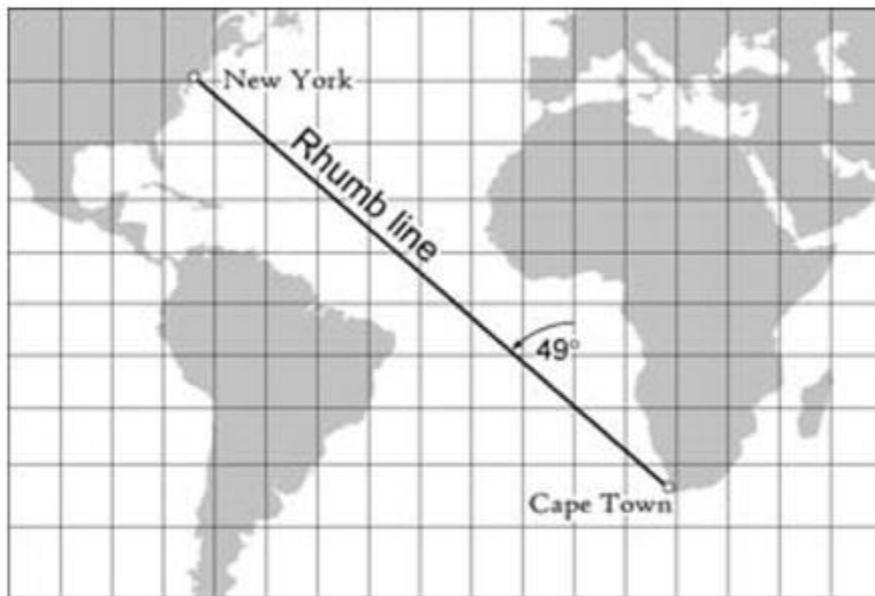


Figure 1.1 When plotted on a Mercator grid, a rhumb line intersects all meridians at the same angle. In this example a constant bearing of forty nine degrees west of north will take a ship from Cape Town to New York.

Picture yourself as a seventeenth-century navigator who knows where he is and where he wants to go. You plot both locations on a chart, join them with a straight line, and measure the angle your line makes with the map's meridians, which run due north. If the chart is a Mercator map, all its meridians are straight lines, parallel to one another, and the course you've just plotted is a rhumb line, also called a loxodrome (fig. 1.1). The derivation of rhumb is obscure—possible origins include a Portuguese expression for course or direction (rumbo) and the Greek term for parallelogram (rhombos)—but mathematician Willebrord Snell (1580–1626) coined loxodrome in 1624 by combining the Greek words for oblique (loxos) and course (dromos). Manuals on piloting accept rhumb as a normal part of the seaman's language and define rhumb line as a line that intersects all meridians at the same angle. The angle between a course and a meridian is a bearing, thus a rhumb line is a line of constant bearing. Stay the course, and you'll reach your destination.

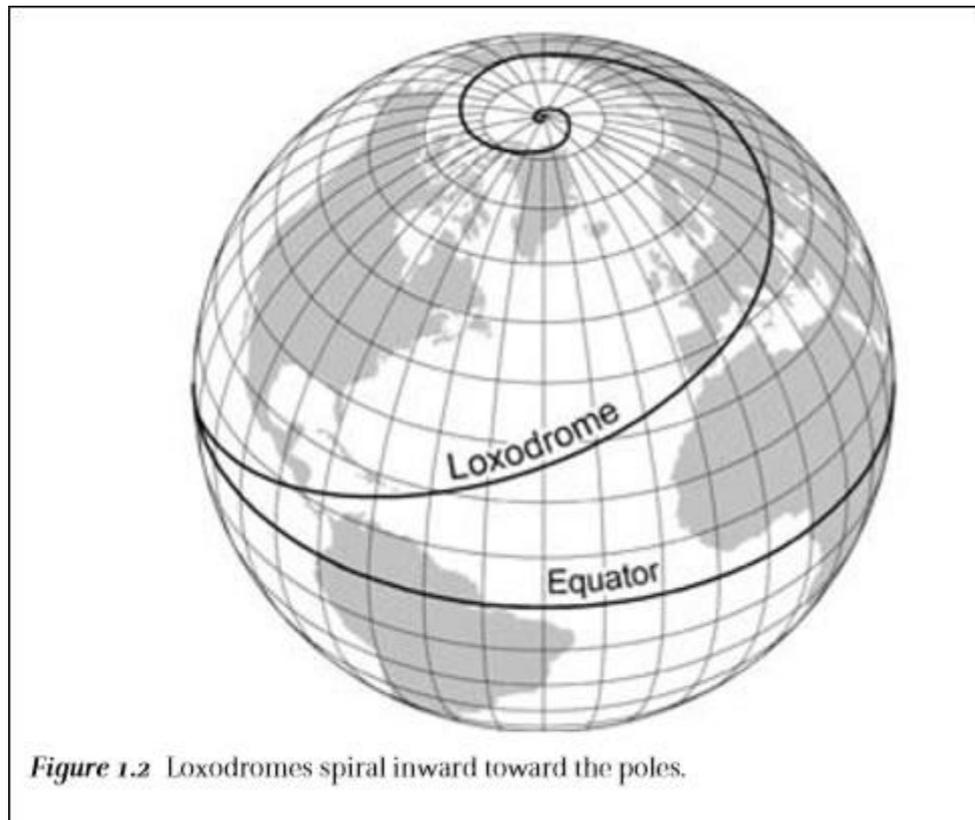


Figure 1.2 Loxodromes spiral inward toward the poles.

Look down at a globe, on which the meridians meet at the North Pole, and you'll understand why loxodromes are spirals that converge toward the pole as they wind round and round, always crossing the meridians at a constant angle (fig. 1.2). The only exceptions are rhumb lines running directly north–south, along a meridian, or directly east–west, along a parallel. The former reach the pole along the shortest possible route, whereas the latter never get any farther north or south. If a bearing is close to due north, its loxodrome approaches the pole rapidly. If a bearing is nearly due east, convergence is notably slower, with a loxodrome that originates in the tropics and circles the globe many times before crossing the Arctic Circle. Follow a loxodrome in the other direction, and it crosses the equator and starts spiraling toward the South Pole. What works in the northern hemisphere works equally well south of the equator. Gerard Mercator (1512–94) understood loxodromes. Skilled in engraving and mathematics, he crafted globes and scientific instruments as well as maps. Like other sixteenth-century globe makers, he engraved the grid lines, coastlines, and other features on copper plates and printed the curved surface in flat sections, called gores, which were trimmed and pasted onto a ball, typically made of papier-mâché. His first experience with globe making occurred around 1537, when he engraved the lettering for a terrestrial globe designed by his mathematics tutor, Gemma Frisius (1508–55). That same year Mercator produced his first map, a six-sheet representation of the Holy Land. In 1541, he devised a navigator's globe on which rhumb lines spiraled outward from compass roses. Intended as a navigation instrument, the globe was approximately 16.5 inches (42 cm) in diameter and consisted of the twelve gores and two polar caps pasted onto a hollow wooden ball for use at sea. According to cartographic historian Robert Karrow, this navigator's globe was the first of its kind, and sixteen surviving copies, crafted between 1541 and 1584, attest to its success and durability.

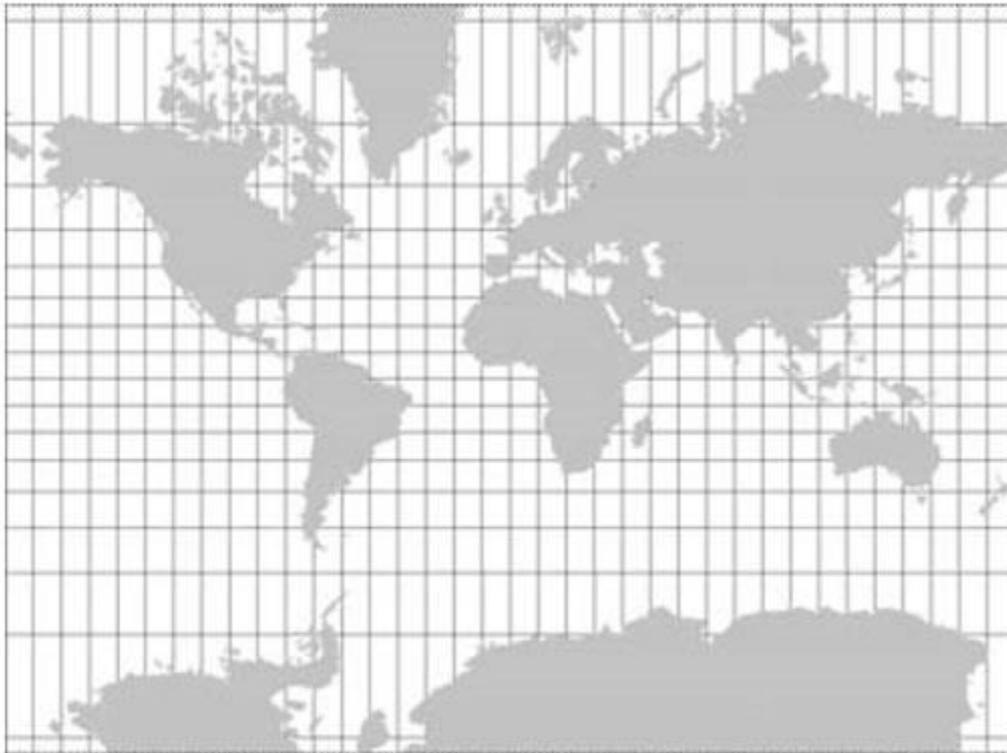
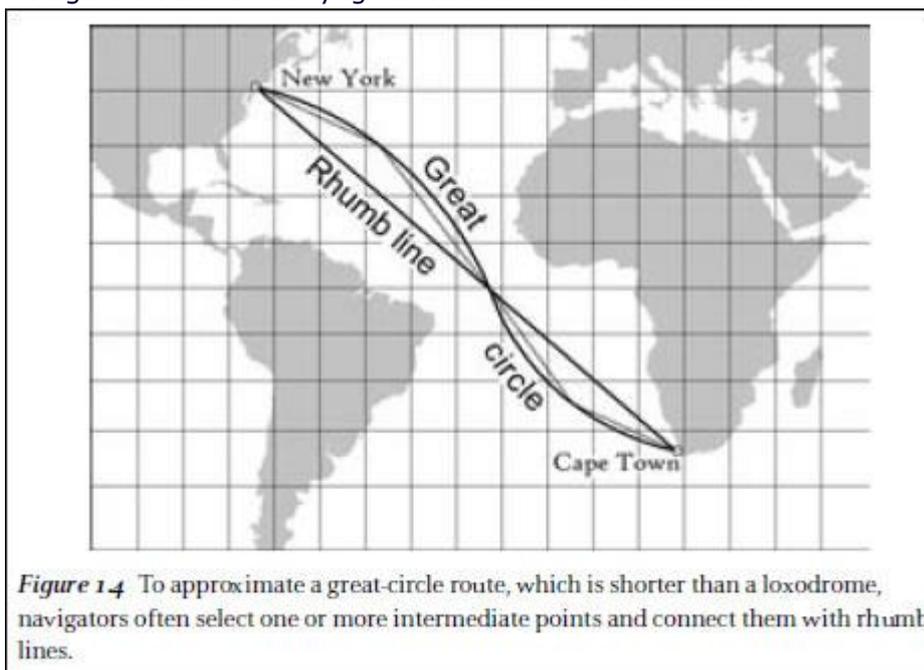


Figure 1.3 A Mercator grid with a ten-degree graticule. The map stops short of the poles because of increased north-south stretching.

Mercator published his celebrated world map of 1569 as a set of eighteen sheets, which form a wall-size mosaic 48 inches (124 cm) tall by 80 inches (202 cm) wide. Its projection revolutionized navigation by straightening out rhumb lines on a flat map—not just the globe’s meridians and parallels, but any rhumb line a seaman might plot. To accomplish this, Mercator progressively increased the separation of the parallels. On a grid with a constant separation of ten degrees between adjoining meridians and parallels—cartographers call this a ten-degree graticule—parallels near the equator are relatively close, whereas those farther poleward are more widely spaced, as shown in figure 1.3. The parallels at 70° and 80°N, for instance, are much farther apart than the equator and its neighbor at 10°N. And the separation between 80° and 90°N cannot be shown completely because the North Pole lies at infinity. Although loxodromes converge toward the poles, on a Mercator projection they never really get there. Mercator’s intent is readily apparent in his map’s title, “New and More Complete Representation of the Terrestrial Globe Properly Adapted for Use in Navigation.” In 1932, the *Hydrographic Review* published a literal translation of the map’s numerous inscriptions, elegantly engraved in Latin. Although the chartmaker’s words reveal little about how he spaced the parallels, Mercator clearly recognized the need “to spread on a plane the surface of the sphere in such a way that ... the forms of the parts be retained, so far as is possible, such as they appear on the sphere. “Accurate bearings, he reasoned, demand a locally exact representation of angles and distances, even though “the shapes of regions are necessarily very seriously stretched.” To compensate for the local deformation that would otherwise occur, Mercator “progressively increas[ed] the degrees of latitude toward each pole in proportion to the lengthening of the parallels with reference to the equator. «Sounds complicated, but it’s not. At 60° N, for instance, the distance on a globe between two meridians is half the corresponding distance at the equator. Because the projection doesn’t let the meridians converge, it must stretch the sixtieth parallel to twice its true length. To compensate for this pronounced east-west stretching along the map’s parallels, the projection imposes an identical stretching in the north-south direction, along the meridians. Farther north, as east-west stretching grows progressively larger, north-south stretching increases

proportionately. At the North Pole, a mere point on the globe, map scale becomes indefinitely large—the result of stretching a dimensionless spot to a measurable distance—and the pole lies “at infinity,” or at least well off the map. That’s why Mercator world maps typically cut off northern Greenland and omit most of an otherwise humongous Antarctica. Forcing north–south scale to equal east–west scale at all points not only preserves angles and bearings but prevents the deformation of small circles into ellipses. Modern cartographic textbooks consider this locally exact portrayal of angles and small shapes, called conformality, highly desirable for detailed, large-scale maps of small areas. In addition to depicting city blocks as rectangles, not parallelograms, a conformal map keeps squares square and circles circular. Although more than a century passed before Edmund Halley (1656–1742) recognized conformality as a mathematical property, Mercator’s 1569 world map became the first conformal projection to portray meridians and parallels as straight lines.

In addition to drawing on his experience in making globes, Mercator borrowed a concept embedded in fourteenth-century regional sailing charts. Portolan sailing charts, named after the portolani, or pilot books, that guided sailors across the Mediterranean Sea or along the coast of Europe, were distinguished by a network of straight-line sailing directions that converge at assorted compass roses. A typical portolan chart was oriented to magnetic north, covered less than one fiftieth of the earth’s surface, and lacked a consistent grid of meridians and parallels. Originally drawn to illustrate books of written sailing directions, portolan charts reduced the uncertainty of navigating across open waters. As the first whole-world sailing chart, Mercator’s map made a transatlantic journey look as straightforward as a voyage from Athens to Alexandria.



However easy to navigate, a loxodrome is rarely as direct as the great circle crudely approximated by a taut thread stretched across a globe between a route’s origin and destination. Great circles, so called because they are the largest circles one can draw on a sphere, provide the shortest path between two points. Although

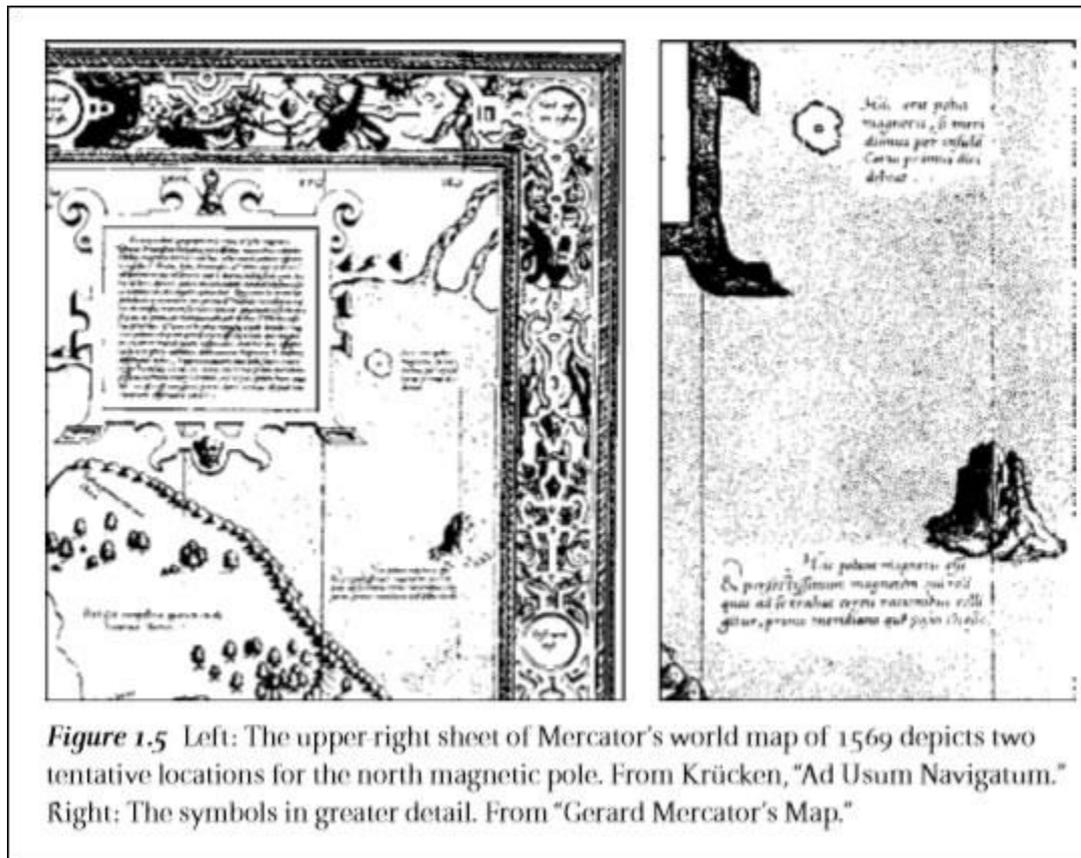
geometrically efficient, they are difficult to navigate because the bearing is constantly changing. The only exceptions are routes along a meridian or the equator. Because a loxodrome is not a great circle, the sailor taking its more easily followed course takes an indirect route. But if the increased distance is long enough to make a difference, the navigator can divide the route into sections and follow the rhumb line for each part. In figure 1.4, a dotted line illustrates a sectioned route from Cape Town to New York. Because the Mercator grid distorts distance, the single rhumb line marking the constant-bearing route looks deceptively shorter than either the great-circle route or its multi-rhumb approximation.

Mercator sought to reconcile the navigator’s need for a straightforward course with the trade-offs inherent in flattening a globe. These trade-offs include distortions of distance, gross shape, and area. Although all world maps distort most (if not all) distances, some projections, including Mercator’s, afford negligible distortion on large-scale detailed maps

of small areas. Only a globe can preserve continental outlines, however, which cannot be flattened without noticeable stretching or compression. Relative size, which is preserved on map projections with a property called equivalence, is markedly misrepresented on Mercator charts because of the increased poleward separation of parallels required to straighten out loxodromes. Distortion of area is most apparent in the chart's inflated portrayal of Greenland as an island roughly the size of South America. On a globe Greenland is not quite an eighth as large.

Like many innovations, the new projection did not catch on right away. One impediment to a wider, swifter adoption was the lack of a detailed procedure for progressively separating the parallels. Wordy inscriptions explained the map's purpose but offered no instructions for constructing or refining its grid. That Mercator produced a generally accurate solution for the lower and middle latitudes was quite an accomplishment in an era with neither logarithms to expedite calculation nor integral calculus to derive a concise mathematical formula. Trigonometric tables of secants and tangents, which might have been especially useful, were also lacking. Some scholars think Mercator used a mathematical approximation to lay out parallels ten degrees apart; a few suggest that he developed the separations graphically by copying loxodromes from a globe to a map. Whatever his approach, Mercator's map stimulated further work by English mathematicians Edward Wright (1561–1615) and Henry Bond (1600–1678), discussed in chapter 5. In 1599, in a treatise with a long title that begins *Certain Errors in Navigation*, Wright included a table of "meridional parts," with which a chartmaker or seaman could efficiently lay down a Mercator grid. And in 1645, Bond suggested a mathematical formula after discovering a similarity between Wright's table and a table of logarithmic tangents.

Another obstacle was the primitive technology for taking compass readings at sea and correcting for magnetic declination. An inscription on the 1569 world map discusses the vexing discrepancy between the poles that anchor the earth's grid and the poles believed to attract compass needles. Eager to include a north magnetic pole on his map, Mercator consulted "a great number of testimonies, "which suggested diverse positions for a magnetic meridian aimed at the magnetic pole. Some observations placed this magnetic meridian in the Cape Verde Islands, where magnetic north coincided with true north; others placed it at Corvo, in the Azores. Equally suggestive was Marco Polo's report that "in the northern parts of Bargu [in northeast Asia] there are islands, which are so far north that the Arctic pole appears to them to deviate to the southward." Without marking the Corvo meridian explicitly on his map, Mercator extended it up over the pole and then south toward Asia. In doing so, he wrongly assumed that compass needles point along great circles that converge at the magnetic poles. Aware that, because of this uncertainty, the location didn't warrant an X or a compass rose, Mercator marked the spot with what looks like a fried egg with a very small yoke (fig. 1.5). An adjacent inscription restates the premise: "It is here that the magnetic pole lies if the meridian which passes through the Isle of Corvo be considered at the first. To hedge his bets, the chartmaker placed a second magnetic north pole farther south and a bit to the east, where a larger symbol that cartographic historians Helen Wallis and Arthur Robinson describe as "a high rocky island" carries a more confident explanation: "From sure calculations it is here that lies the magnetic pole and the very perfect magnet which draws to itself all others, it being assumed that the prime meridian be where I have placed it." Confronting uncertainty, Mercator used a pair of "extreme positions" to bracket the magnetic pole's true location "until the observations made by seamen have provided more certain information. "Too few present-day cartographers, sad to say, are as frank about geographic ambiguity.



Ships carried magnetic compasses as early as the twelfth century, but seamen seldom used them because of an innate mistrust of innovations as well as quirky needles that didn't point directly north. Magnetic declination was not discovered until the fifteenth century, and as Mercator's experience illustrates, geomagnetism proved less wellbehaved than sixteenth-century mapmakers had originally believed. Adjustment for geomagnetic distraction was not possible until 1701, when Edmund Halley published a pioneering but simplistic map of isogons (lines of equal magnetic declination) for the Atlantic Ocean (fig. 1.6). Determining a ship's location at sea was equally troublesome. Latitude could be figured simply by sighting on the northern star at night or by measuring the sun's noontime elevation above the horizon, but longitude, calculated from the difference between local time and time at the prime meridian, required a highly accurate chronometer, not available until the mid-eighteenth century, when John Harrison (1693–1776) devised a clock that lost only fifteen seconds in 156 days. The ship's compass, magnetic adjustment, and an accurate chronometer were parts of a puzzle that included Mercator's projection. Not until all the pieces were in place could mariners fully appreciate Mercator charts.

modern versions of the Mercator projection. English argues that Mercator no doubt knew of Etzlaub's invention and that "the projection of varying latitudes should be known as the Etzlaub-Mercator projection."



Wright and Etzlaub are not the only

Figure 1.7 Latitude gradations along the sides of Erhard Etzlaub's 1511 "compass map" reflect the progressive spacing of parallels characteristic of the Mercator projection. From Kretschmer, "Mercators Bedeutung," 163, fig. 4.

mapmakers in line to share Mercator's fame. Another contender is the unidentified Chinese scholar who drafted the tenth-century Dunhuang star map. According to *The Timetables of Science*, a chronology published in 1988 and cited on several Web sites, the star chart "uses a Mercator projection [and is] the first known use of this kind of map projection." I tracked this assertion no further than the multivolume *History of Cartography*, which includes a black-and-white photo of the narrow, scroll-like map. How the claim arose is a puzzle insofar as the chart contains neither a grid nor marginal tick marks. As a key sentence in its caption tellingly observes: "There is no attempt at a projection on this rather crude chart." Projection guru John Snyder wholly ignored the Dunhuang star chart in his epic history of map projection, in which he noted Etzlaub's "similar projection" but concluded that "the principle remained obscure until Mercator's independent invention." Anyone who thinks cartographic folklore inflates Mercator's contribution should be mollified if not amused by an offhand comment in the U.S. Coast and Geodetic Survey's bible on map projection, introduced in 1921 and shepherded through numerous revisions by Charles Deetz and Oscar Adams. In discussing the sinusoidal projection, on which converging meridians yield a world map shaped like an antique Christmas ornament, Deetz

and Adams noted the occasional use of an alternative name, Sanson-Flamsteed projection, commemorating Nicolas Sanson and John Flamsteed, who used it around 1650 and 1729, respectively. In their opinion, the projection “might well have been termed the ‘Mercator equal-area projection’ in the first place, from the fact that the early atlases bearing his name gave us the first substantial maps in which it is employed. Mercator’s name has, however, been so clearly linked with his nautical conformal projection that it becomes necessary to include with his name the words equal area if we wish to disregard the later claimants of its invention, and call it the Mercator equal-area projection.” To underscore the point, they titled the section “Sinusoidal or Mercator Equal-Area Projection.” Whatever its authorship, the better-known Mercator conformal projection gathered adherents among scientists as well as navigators. Noteworthy adoptions include Robert Dudley’s pioneering sea atlas of the world, published in 1647, and Edmund Halley’s revolutionary maps of the trade winds and magnetic declination, published in 1686 and 1701, respectively. In 1769 the Mercator grid provided the geographic framework for a ground-breaking Gulf Stream chart by Benjamin Franklin and whaling captain Timothy Folger, and in the early nineteenth century it gained wider exposure in the influential line of geography textbooks written and published by Jedidiah Morse, father of portrait painter and telegraphic experimenter Samuel F. B. Morse. In 1919 Vilhelm Bjerknes, the Norwegian meteorologist who discovered fronts and air masses, proposed the Mercator projection as the world standard for weather maps of the tropics, and in 1937 the World Meteorological Committee recognized the importance of conformality on atmospheric maps by endorsing Bjerknes’s recommendation. In the commercial sphere, publishers of reference atlases and wall maps adopted the Mercator grid for regional maps of Australia, the Pacific islands, and the world’s oceans. To the disgust of geographic educators, Mercator’s grid framed many whole-world maps with no bearing on navigation, weather, or geophysics. As I show in chapter 9, geopolitical motives were apparent in a few cases, but much of the projection’s misuse reflects a mix of comfortable familiarity, public ignorance, and institutional inertia. No one was hawking the Mercator brand, at least not overtly, but no one had to—many people who grew up with the map apparently believed this was how a flattened earth should look. How else to explain the ascendancy of an utterly inappropriate perspective and widespread resistance to superior substitutes? If there is a villain here, it’s not Gerard Mercator, who used equal area maps in his atlases and was quite clear about why he devised a rectangular conformal projection. Wary of wrongheaded finger pointing, Deetz and Adams chided the chartmaker’s critics in verse:

Let none dare to attribute the shame
Of misuse of projections to Mercator’s name;
But smother quite, and let infamy light
Upon those who do misuse, Publish or recite.

Although

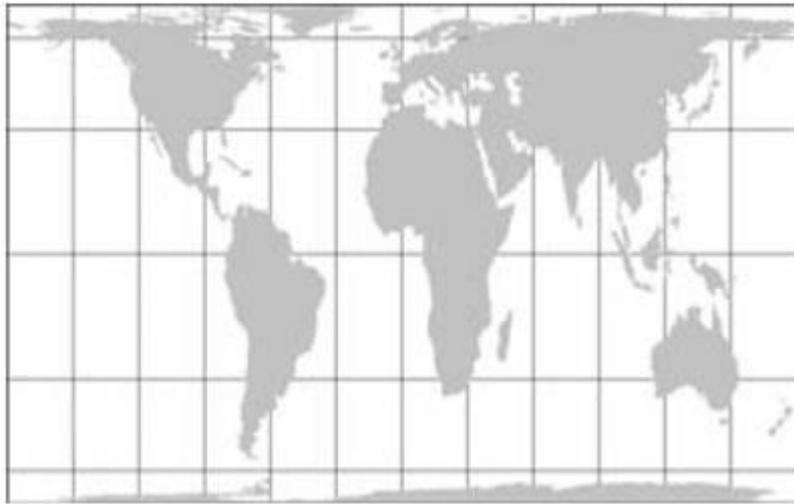


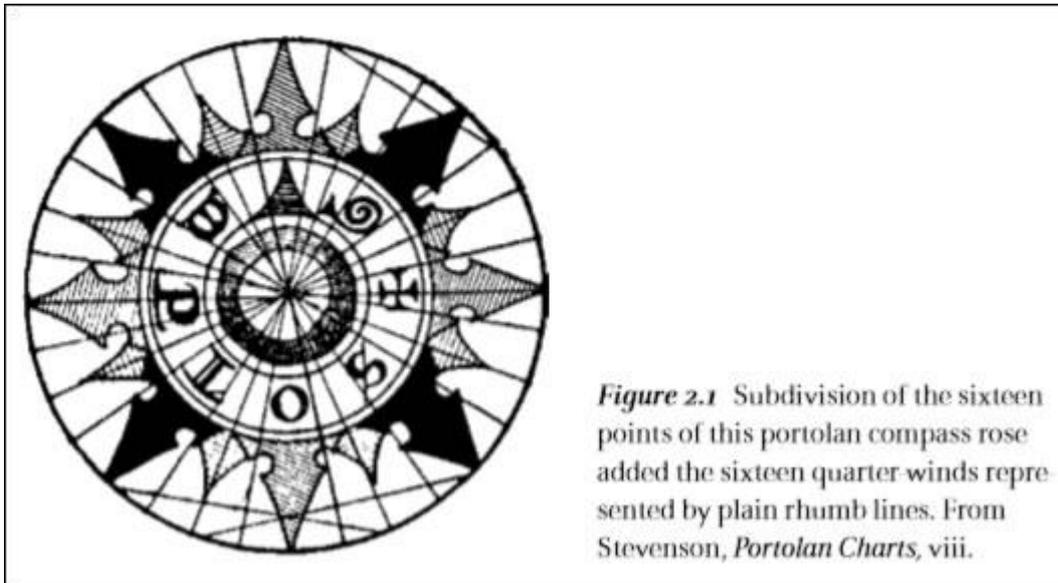
Figure 1.8 Proposed inappropriately as the only suitable substitute for the Mercator map, the Peters projection grossly distorts the shapes of Africa and South America. This example employs a thirty degree graticule.

educators and scientists understood the problem, few seemed willing to challenge the conventional stupidity.

The most famous attack on the Mercator map's undeserved prominence came well after the tide had turned. In the 1970s German historian Arno Peters (1916–2002) proposed a ludicrously inapt solution now known as the Peters projection. As chapter 11 explains, the Peters map is not only an equal-area map but an exceptionally bad equal-area map that severely distorts the shapes of tropical nations its proponents profess to support. Its popularity among Third World advocacy groups like Oxfam and the World Council of Churches is hard to explain. Perhaps it's a reflection of what I call the Monty Python Effect, named for the parody troupe's well-known transition line, "And now for something completely different." To most people who see it for the first time, the Peters map is indeed different: as figure 1.8 illustrates, Africa and South America look like land masses stretched into submission on a medieval torture rack. In asserting a new solution to an old problem, Peters ignored other, demonstrably better equivalent projections. And in claiming his projection was original, he overlooked an identical map presented in 1855 by James Gall (1808–95), a Scottish clergyman. Dare I say it? Peters had a lot of Gall in as many ways as possible. Mercator's legacy is much more than the life and works of a Flemish chartmaker. As the remaining chapters illustrate, the Mercator projection lies at the intersection of a diverse collection of intriguing tales about navigation, cartographic innovation, military precision, media mischief, and political propaganda.

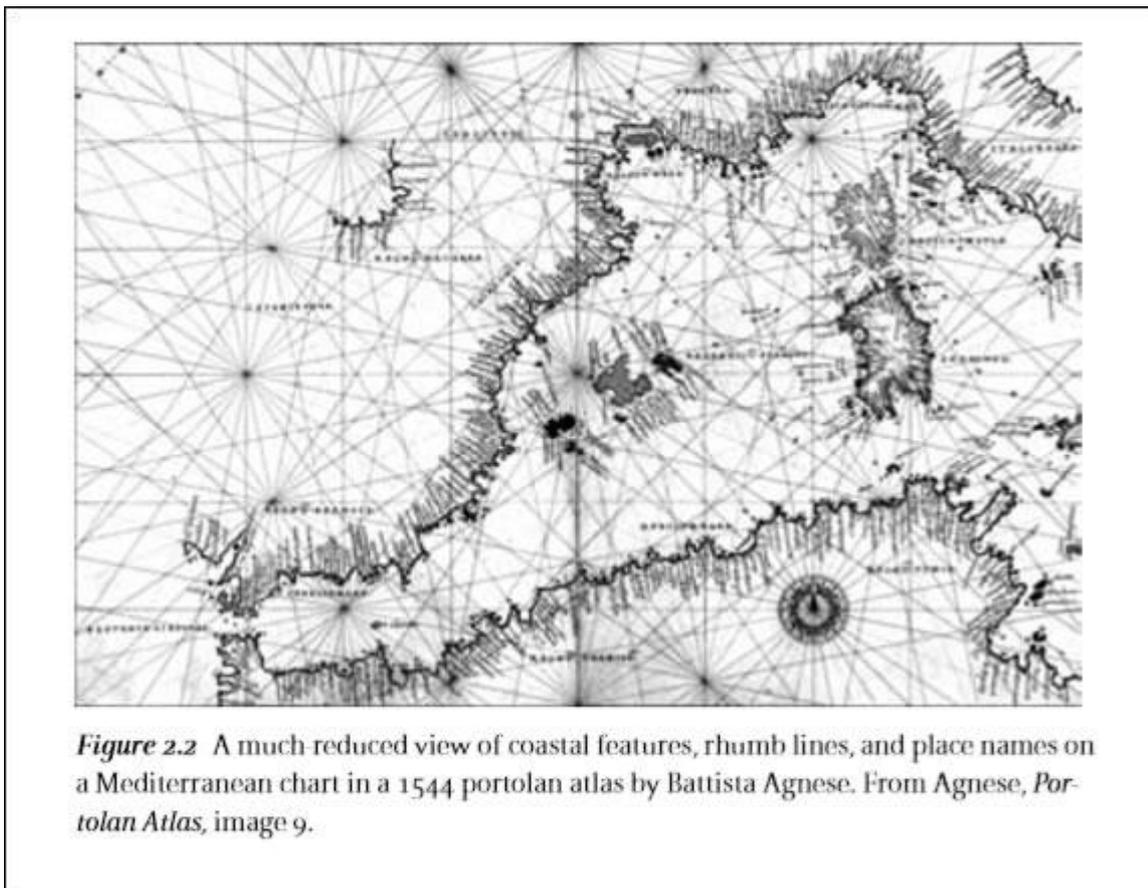
Early Sailing Charts

As predecessors go, portolan charts are an impressive lot. In addition to having held the mathematically superior Mercator projection at bay for a century or two after its initial presentation in 1569, they attract a far greater following among map historians, who recognize them as a distinct cartographic genre. And as this chapter observes, portolan charts not only taught mariners to rely on sailing charts but also left a legacy of geographic detail for later mapmakers.



It's easy to treat portolan charts as both enigma and

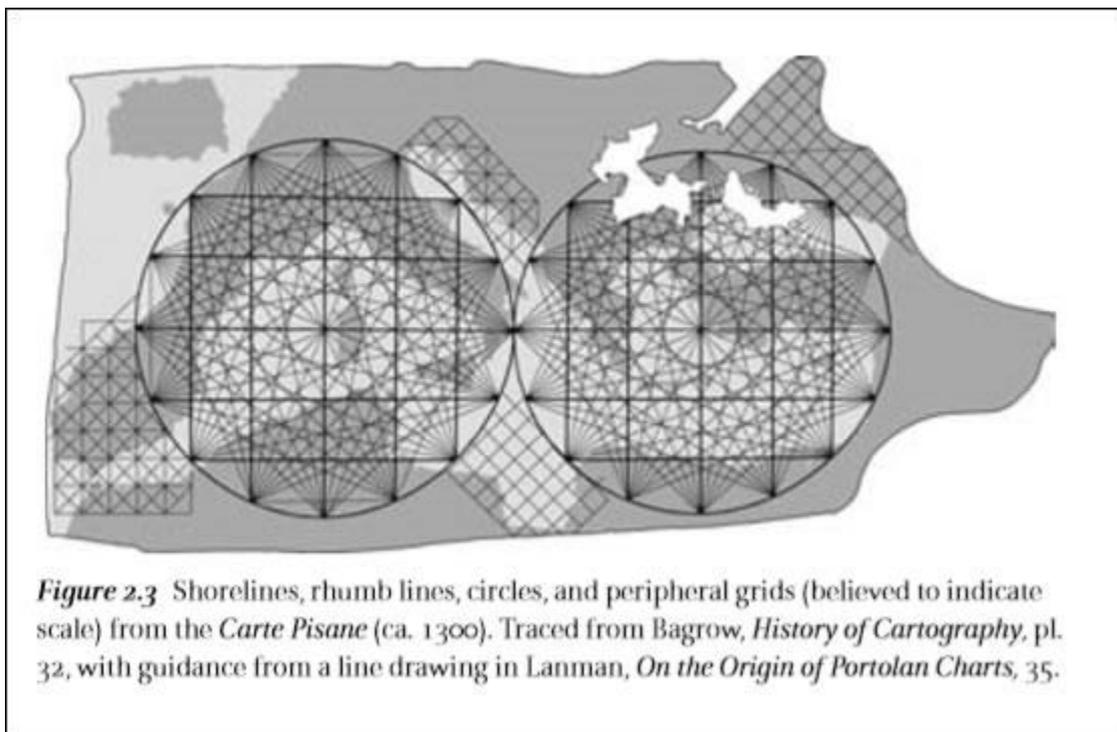
innovation. They appeared suddenly in the late thirteenth century with crisscrossed rhumb lines and abundant place names, all in sharp contrast to the prevailing religious cartography typified by small, sparse, east-up world maps centered on Jerusalem. Unlike the medieval mappae mundi, which were largely inspirational, portolan charts were practical tools for crossing open waters. And unlike the well-documented publication of Gerard Mercator's world map, the murky origin of the portolan charts has invited much speculation, not likely to be resolved, about whether Italians or Catalan Spaniards crafted the ultimate prototype, which historians have yet to find.



In their handbook of cartographic innovations, map historians Helen Wallis and Arthur Robinson list four key characteristics of portolan charts. Foremost is the web of intersecting rhumb lines, typically originating on the circumference of a circle, around which sixteen equally spaced points represent the eight principal wind directions (N, NE, E, SE, S, SW, W, and NW) and the eight half-winds (NNE, ENE, ESE, ...) of the mariner's compass (fig. 2.1). On

most charts the circle is readily apparent in the points at which rhumb lines converge like spokes in a wheel. Look closely at the portolan chart in figure 2.2, which covers the western Mediterranean, and you'll see traces of a large circle centered at the middle of the chart and touching the top and bottom edges. Rhumb lines also converge at the circle's center, and at the lower right, over North Africa, one of the sixteen intersection points on its perimeter serves as a compass rose. On some oblong portolan charts, like the example in figure 2.3, adjacent circles cover eastern and western parts of the map.

Closer inspection of the chart in figure 2.2 reveals a second distinguishing trait: an abundance of closely spaced, hand-lettered place names perpendicular to the shoreline and always inland, to avoid conflict with coastal details. Additional labels over water identify small islands. Because chartmakers inked in these names one after the other in a continuous coastwise sequence, labels appear inverted where the shoreline reverses direction. A third characteristic is color-coded names and directions. More important places, labeled in red, stand out from less significant neighbors, lettered in black. Color also reduces confusion among rhumb lines, inked in black or brown for the eight principal winds, in green for the eight half-winds, and in red for the sixteen interspersed quarter-winds. The fourth trait is a functional generalization that rounds minor coastal irregularities, overstates bays and headlands, and uses crosses and dots to point out rocks and shoals. Except for lavishly decorated versions intended for royal collectors, portolan charts showed what mariners needed to know and not much else.



Inked on treated animal skin called vellum, portolan charts withstood rough handling at sea better than paper navigation charts, which did not become common until the eighteenth century. Animal hides were especially suited to the Mediterranean's pronounced east-west elongation. After splitting the calf's or sheep's skin along the stomach, the vellum maker removed the appendages and head but kept the neck, which formed the noticeably narrowed end of a large oblong drawing surface. The typical portolan chart is drawn on a single skin with the tapered end pointing west, to accommodate the Mediterranean's narrowed reach toward the Atlantic. The flesh side of the skin provided a smooth writing surface; younger animals, with fewer scars, were preferred. Treatment included soaking the hide in lime, scraping off hair and flesh, stretching over a drying frame, rubbing with pumice to smooth the surface, and massaging with chalk to create a neutral, off-white background. Although the charts could be rolled for easy storage—like a thin leather glove, vellum is flexible—some were mounted on wood or cardboard to prevent shrinkage.

Medieval chartmakers are not wholly anonymous. Tony Campbell, the British Library's former map librarian who wrote the chapter on portolan charts for the multivolume *History of Cartography*, lists forty-six individuals known to have produced portolan maps or atlases before 1500. Especially noteworthy are Pietro Vesconte, a Genoese mapmaker whose earliest known nautical map is a 1311 chart of the Mediterranean and the Black Sea, and Giovanni da Carignano, a Genoese abbot once credited with the earliest dated portolan chart, believed to have been drafted around 1300. No one questions Carignano's authorship of the chart, which was destroyed during World War II, but comparison of photographic copies with other maps of the period reveals place names not widely known or used until the 1320s. Cartography was not Carignano's vocation, but by the late fourteenth century demand for sailing charts was supporting specialist chartmakers in the Italian ports of Genoa and Venice as well as their Catalan counterparts of Barcelona and Majorca.

At least a few medieval chartmakers benefited from an edict endorsing navigation maps. In 1354 King Peter of Aragon ordered all ships to carry two portolan charts, the second perhaps as backup if the other were ruined. Peter's ordinance reflected the charts' value as navigation aids as well as the consequences of a ship foundering or getting lost. The earliest surviving record of a chart used at sea is an account of a 1270 voyage by France's King Louis IX. Because of rough weather the captain decided to seek shelter at Cagliari, in Sardinia, and brought out a chart to reassure the frightened monarch that land was nearby.

The oldest known portolan chart is the *Carte Pisane*, drafted around 1290 in Genoa but named after Pisa, where it was discovered. Shown schematically in figure 2.3, the chart measures 20 by 41 inches (50 by 104 cm), encompasses the Mediterranean and part of the Black Sea, and includes all four characteristics of its genre. Separate circles anchor two networks of rhumb lines. Hidden on later charts, the circles here are inked in and obvious. Beyond the circles are several squarish grids, with no apparent role. Although seventeenth-century mapmakers used temporary grids, sketched in pencil, as guides for copying features from other charts, erasable pencils were not available until the sixteenth century. Tattered edges and missing fragments of vellum toward the upper right reflect repeated handling. Acquired in 1839 by the *Bibliothèque Nationale*, the *Carte Pisane* is a lucky survivor. Campbell, who uncovered fewer than two hundred pre-1500 portolan charts in public and private collections, dedicated his chapter to "the thousands of ordinary charts that served their purpose and then perished."

Although scholars have yet to uncover a detailed description of medieval chartmaking, they're certain that portolan charts were copied by hand from existing charts. Microscopic analysis of inked lines and tiny pinholes indicates that chartmakers first laid out the rhumb circle by using dividers (an instrument with two sharp points for transferring exact dimensions) to mark its center and sixteen equally spaced points on its circumference. Using the pinpricks as guides, artisans inked in the network of rhumb lines with pen and straightedge. They then transferred the shorelines from a master map, but exactly how remains a mystery. Some chartmakers apparently forced a fine powder through small holes in a master pattern placed over the fresh vellum, some used a crude form of carbon paper, and some are alleged to have anchored the master map on a transparent frame or table, placed the vellum on top, positioned a strong light source on the opposite side, and traced coastlines and other features directly. Still others might have been exceptionally good at visual transfer—what my cartography students call "eyeballing it." Once the shorelines were laid down, transferring the place names was a straightforward yet painstaking process.

The prevalence of copying raises questions about the ultimate master chart: who crafted it, when, and how? Although map historians hold little hope of identifying the first chartmaker, they're certain the prototype portolan chart—if indeed there was only one—was compiled from maps of smaller areas based on books of sailing directions called *portolani*. Written to help seamen find ports and avoid hazards along the Mediterranean coast, these medieval Italian sailing guides have an equally obscure origin. Although sailors had been taking notes on coastal navigation for over a millennium, pilot books with

distances and bearings as well as shoreline narratives emerged at about the same time as the portolan charts. Or perhaps a bit before: extant portolan charts greatly outnumber surviving portolani, which were not decorated and never caught the fancy of royal collectors.

Wary of untested assumptions, Jonathan Lanman, a retired medical researcher and map collector, compiled sailing maps from the *Lo Compasso de Navigare*, a pilot book from the late thirteenth century, and the *Parma-Magliabecchi Portolano*, from the fifteenth century. Although fragments of older sailing guides exist, these were the earliest, most complete examples he could locate. To assess the cartographic validity of their sailing directions, he reconstructed the Mediterranean shoreline by chaining together straight-line segments based on distances reported in Italian sea miles,¹ sea mile equaling 0.67 nautical miles (1.23 km), and bearings based on a thirty-two-point compass rose. Rotation of the resulting plots and careful alignment with the present-day shoreline revealed a realistic representation of the Mediterranean coast. Despite less than perfect matches, Dr. Lanman demonstrated that the information in the sailing guides was fully adequate for drawing dependable portolan charts.

Curious about the roles of map projection and magnetic declination, Lanman examined the geometric accuracy of the *Carte Pisane* and a second chart drawn in 1559 by Matteo Prunes, a Majorcan chartmaker. Although cartographic historians generally consider portolan charts “projectionless” for lack of a graticule, Lanman suggested they were “drawn on a square grid” noticeably skewed as a result of magnetic declination. Although evidence of an overt grid is speculative—Lanman’s argument rests largely on small squares within the rhumb circles of the *Carte Pisane* and few other charts—locally reliable shapes reflect at least an unconscious appreciation of conformality, a key property of the Mercator projection. Researchers who have confirmed this proto-conformality (my term) include Waldo Tobler, a pioneer in computer cartography, who observed a strong similarity between a 1468 chart by Majorcan chartmaker Petrus Roselli and an oblique Mercator projection. And in a cartometric analysis of twenty-six charts, Scott Loomer, a cartography instructor at West Point, found strong correlations with conformality and straight loxodromes—exactly the properties needed for reliable navigation over open waters. Because a medieval sailing chart typically covered a small area, its informal, ad hoc projection was not a serious weakness.

Some historians recognize the 4 by 4 grids within the *Carte Pisane*’s rhumb circles as linear scales, running vertically as well as horizontally. Intersecting grid lines divide a distance of roughly 200 miles into four equal parts, and horizontal and vertical scales that are similar—or would be if the interior elements were perfect squares—signify the chartmaker’s unconscious pursuit of conformality. At least that’s how map historians interpret the grid. Unlike the scale bars on contemporary maps, scales on portolan charts didn’t specify distance.

The role of the magnetic compass in the compilation and use of portolan charts remains contentious. Did the compass play an important part in the compilation of early prototypes, or did it merely contribute to a more effective use of sailing charts and later updates? According to Lanman, the orientation of map features accords well with historic trends in magnetic declination. But in Tony Campbell’s view the jury is still out. The magnetic compass was in use by the thirteenth century, but it’s questionable whether instruments available around 1290 were sufficiently reliable to have contributed significantly to either the *Carte Pisane* or contemporary portolani. Magnetic variation, which could provide a clue, is difficult to reconstruct, especially before 1600. Although a westward increase in magnetic deviation in the region was apparent until the seventeenth century, local magnetic anomalies thwart a reliable reconstruction of local details. What’s certain is that chartmakers corrected their bearings after better measurements became available around 1600.

Four centuries of portolan charts document European exploration of the African, American, and Asian coasts as well as advances in seamanship in England, Portugal, and what is now the Netherlands. For an appreciation of these improvements, compare the vague rendering

of the Mediterranean coast on the Carte Pisane (see fig. 2.3) with the more detailed shorelines in the 1544 map by Venetian mapmaker Battista Agnese (see fig. 2.2). The more recent map is a double-page spread from a portolan atlas in the U.S. Library of Congress's cartographic collection. Several of the atlas's nine charts encompass the east and west coasts of North and South America, and a world map depicts the global journey of Ferdinand Magellan's crew—the explorer died en route— as well as a meandering course from Spain to Panama and then down the coast to Peru. As the charted world expanded beyond the Mediterranean, navigators found the atlas format, with maps on vellum bound in leather, convenient for protecting their charts as well as accommodating new knowledge too detailed for a single map.

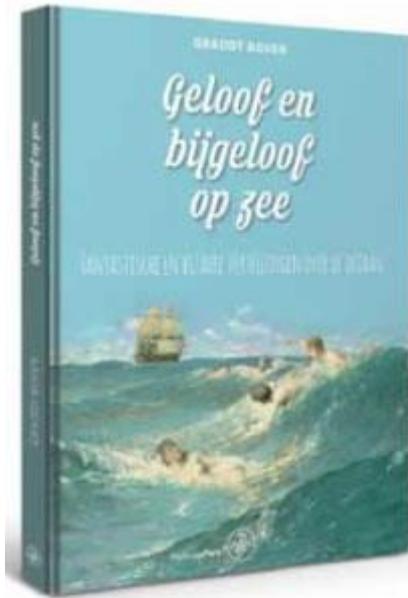
Expansion of detailed coverage into the Atlantic encouraged cartographers to correct scale disparities between the charts' Atlantic and Mediterranean sections. Because pilot books for these areas had been compiled independently, with no attempt to resolve inconsistencies, early portolan charts underestimated distances along the North Atlantic coast by 16 to 30 percent relative to distances in the Mediterranean. These discrepancies persisted until 1403, when Francesco Beccari responded to feedback from mariners with a new chart that also corrected another reported deficiency. As the Genoese chartmaker's inscription reveals, "It was several times reported to me by many owners, skippers and sailors proficient in the navigational art that the island of Sardinia ... was not placed on the charts in its proper place. Having listened to the aforesaid persons I placed the said island in the present chart in the proper place." Several decades passed before other chartmakers adopted Beccari's adjustments.

Since portolan charts were constructed from bearings and distances rather than a determination of geographic coordinates, they lacked indications of latitude and longitude and explicit projections. In the sixteenth century, latitude scales made a halting appearance on sailing charts, but even then, they were simply laid over the framework of rhumb lines, rather than integrated with it. Figure 2.4, a chart from a 1582 atlas by Spanish cartographer Giovanni Martines, shows this disconnect. The north-south and east-west lines on the chart do not represent particular meridians or latitudes; they are simply the extensions of these cardinal directions from the various wind roses. Even so, a navigator with dividers could determine his destination's latitude, use a quadrant or astrolabe (instruments for measuring latitude at sea) to guide him north or south to the right parallel, and then sail due east or west to the intended port. Mariners call this parallel sailing.

Inséré 13/04/21 BOEKEN LIVRES BOOKS Enlevé 13/06/22

"Geloof en bijgeloof op zee"

BOEKBEPREKING door : Frank NEYTS



Bij uitgeverij Walburg Pers verscheen het interessante boek **"Geloof en bijgeloof op zee"**. Fantastische en bizarre vertellingen over de oceaan". Het werd geschreven door Graddy Boven.

De zee is wonderlijk, immens en mysterieus. Spiegelglad of woest, verontrustend en verraderlijk. De oneindigheid van de zee intrigeert en de aantrekkingskracht op de mens is ingrijpend groot. Door de eeuwen heen zijn spelenderwijs fantastische en bizarre vertellingen over wel en wee van de oceanen ontstaan. Rondtrekkende vertellers spraken over oneindige diepten en verhaalden onder andere over sirenes die met hun gezang zeelieden de dood inlokten. Geen wonder dat de gelovige en bijgelovige zeeman voortdurend worstelde met de mysteries van de zee.

'Geloof en bijgeloof op zee' vertelt over Neptunus, watervrouwen, zeemonsters, kerk, schip en de dood, wereldlijke zeehelden, sierschepen, de Vliegende

Hollander, luchtspiegelingen en de Bermudadriehoek en diept het verschil tussen geloof en bijgeloof uit. Het boek beschrijft de schepen die het zeegevaar uitvoeren op weg naar het onbekende. Velen keerden terug, velen niet. Opgeslokt door de geheimen van de zee. Wie denkt dat de zee tegenwoordig geen geheimen meer heeft, komt bedrogen uit. Diep in de zee speelt zich nog steeds van alles af. Zaken waarvan de mensheid nooit, maar dan ook nooit, weet zal hebben.

"Geloof en bijgeloof op zee" (ISBN 9 789462 494459) telt 128 pagina's, werd als hardback uitgegeven. Het boek kost 24,99 euro. Aankopen kan via de boekhandel of rechtstreeks bij Uitgeversmaatschappij Walburg Pers, Postbus 4159, 7200BD Zutphen. Tel. +32(0)575.510522. Bestellen kan via de Walburg Pers website. In België wordt het boek verdeeld door Agora Uitgeverscentrum, Aalst/Erembodegem. Tel. 0032(0)53.78.87.00, Fax 0032(0)53.78.26.91, www.boekenbank.be, E-mail: admin@agorabooks.com.

Inséré 15/05/22 NIEUWS NOUVELLES Enlevé 15/06/22

Zulu Associates heeft het scheepsontwerp klaar voor zijn gloednieuwe 'X-Barge'.



Emissieloos en autonoom varend binnenschip 'X-Barge' van Zulu Associates

Het eerste emissieloos en autonoom varend binnenschip zonder bemanning uit de reeks wordt tegen eind 2023 in de vaart verwacht.

Antoon Van Coillie, die een aantal jaren geleden het 'pallet shuttle barge'-concept 'Zulu' lanceerde, concentreert zich nu met Zulu Associates volop op autonoom en emissieloos varen. De 'X-Barge' is een 'CEMT klasse IV'-binnenschip van 1.500 ton met een capaciteit van 80 teu. Naargelang het operationeel profiel van het schip wordt ook de zero-emissievoortstuwning bepaald. Dat kan bijvoorbeeld op elektrische batterijen of op waterstof zijn.

2030

Er komen minstens twee van dit type schepen in de vaart. Op termijn mikt Zulu Associates op een nieuwbouwworder van tien schepen. "We willen op een gestandaardiseerde manier een nieuwe vloot uitbouwen om tegen 2030-2035 een netto-nuluitstoot te bereiken", vertelt CEO Van Coillie. "Een van de belangrijkste toekomstige KPI's in de transportsector is de hoeveelheid energie die je nodig hebt per tonkilometer. De bestaande schepen in de vaart zijn nooit ontworpen geweest om zo weinig mogelijk energie te gebruiken, maar om zo veel mogelijk volume mee te nemen. Door de klimaatcrisis zitten we nu in een andere wereld."

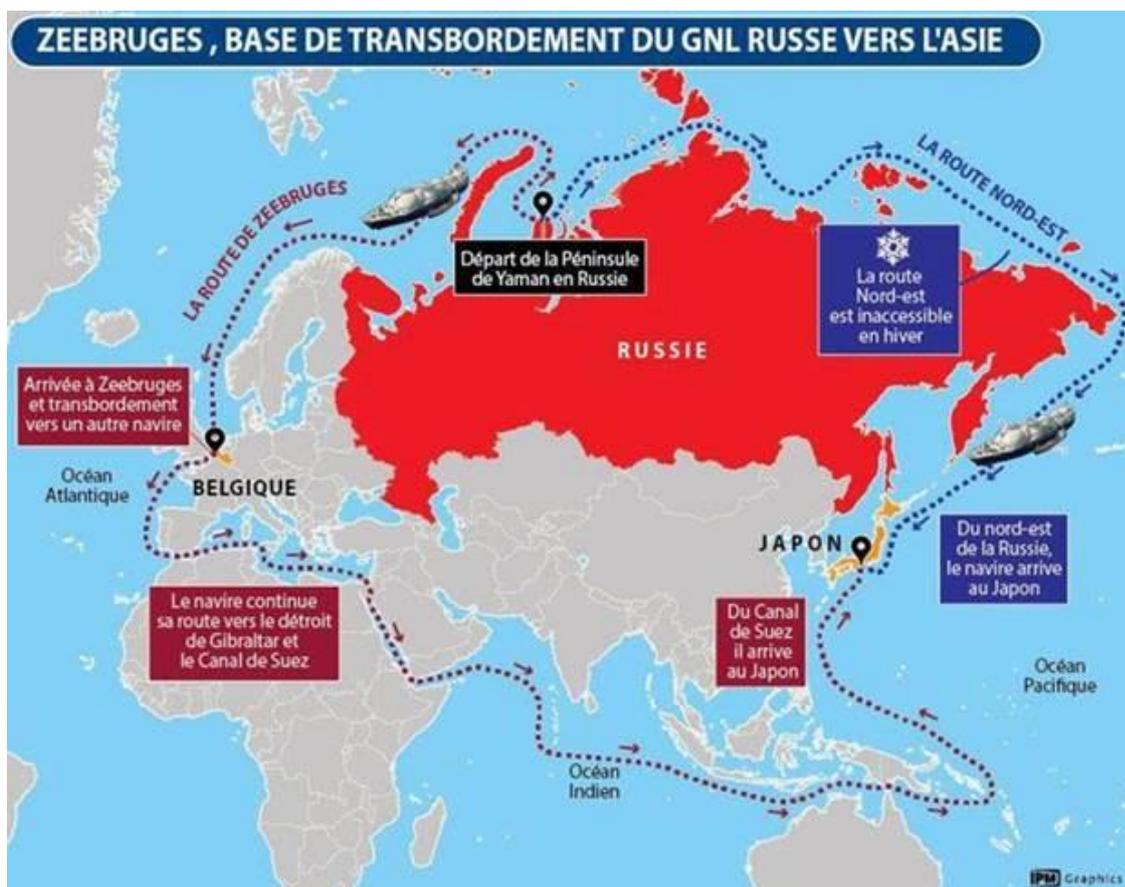
Kleine diepgang

Bij de ontwikkeling van de 'X-Barge' wordt onder meer een energie-efficiënte rompvorm toegepast. Het schip krijgt een kleine diepgang om ook bij lage waterstanden te kunnen varen. "We zitten in de laatste fase van het scheepsontwerp en zullen in de zomer van 2022 gesprekken voeren met scheepswerven die kandidaat zijn om het eerste schip te bouwen", vertelt hij.

Het eerste schip moet in het najaar van 2023 in de vaart komen. De schepen zullen worden uitgecharterd en ingezet in België, Nederland, Duitsland en Frankrijk.

Inséré 16/05/22 NIEUWS NOUVELLES Enlevé 16/06/22

Les Russes misent sur Zeebruges pour écouler leur gaz liquéfié vers l'Asie



C'est ce qu'on appelle un mauvais timing. Début 2020, le navire Yenisei River amarrait dans le port de Zeebrugres, après un très long périple. Le méthanier russe arrivait depuis la péninsule de Yamal, en Sibérie arctique. Il était le premier d'une longue série et marquait le début du contrat à long terme conclu en 2015 entre Fluxys et le géant Yamal Trade pour des services de transbordement.

Selon l'accord signé pour 20 ans avec les Russes, jusqu'à 8 millions de tonnes de GNL (gaz naturel liquéfié) pouvaient ainsi être transbordées au Terminal de Zeebrugres chaque année, ce qui pouvait générer un trafic supplémentaire de 214 méthaniers par an dans le port flamand. "Dans les faits, nous en sommes actuellement à 2 ou 3 millions de tonnes de GNL provenant de Russie cette année", explique Rik Goetinck, le directeur stratégique et vice-président du port de Zeebrugres. Malgré les sanctions occidentales, les navires russes continuent d'arriver dans le port de la côte belge. "Nous suivons les termes du contrat. Mais si les autorités belge ou européenne nous disent d'arrêter, nous arrêterons immédiatement. Nous ne voulons pas faire de politique." Et M. Goetinck de rapidement préciser que très peu de GNL russe ne reste sur le territoire belge, ni même européen. Zeebrugres a ainsi été choisie comme base de transbordement pour la livraison de gaz russe aux pays de la zone Asie-Pacifique pendant la période de gel du passage dit du Nord-Est qui empêche tout bateau d'emprunter cette voie maritime.

Une route fermée plusieurs mois par an

Découvert en 1974, l'immense champ gazier du projet "Yamal" se situe ainsi à 600 km au nord du cercle polaire, en Sibérie occidentale. Les conditions climatiques sont extrêmes dans cette région nommée South Tambey qui est prise dans les glaces 7 à 9 mois par an. Il y fait nuit deux mois par an et les températures peuvent chuter jusqu'à - 50°C. "En hiver, aucun bateau ne peut utiliser la voie Nord-Est, en raison des glaces, pour se rendre de la Sibérie vers la région Asie-Pacifique", poursuit le responsable du port belge. Les navires russes prennent donc la direction opposée, celle de l'Ouest, pour se rendre en Extrême-Orient (voir infographie). "Cette route du Nord-Ouest nécessite l'utilisation de

brise-glace, qui sont très chers. Une fois à Zeebruges, on transborde ainsi le GNL vers des méthaniers plus classiques et surtout économiques." Qui repartent vers l'Est. Une bonne partie de ce GNL part vers l'Extrême-Orient, le Japon, mais cela dépend aussi de la situation et des fluctuations mondiales : les méthaniers essaient d'aller vendre leur gaz là où les prix sont les plus chers du moment." Le GNL consommé en Belgique provient actuellement essentiellement du Qatar d'où il arrive via d'énormes méthaniers avant d'être transformé et redistribué sur le réseau de notre pays. Notons que ces bateaux sont souvent moins polluants que les navires traditionnels car ils utilisent du GNL pour leur propulsion et non du fuel classique. Zeebruges est aussi relié à un important réseau gazoduc provenant de Norvège.

"Le GNL va lentement disparaître"

Côté brugeois, on se prépare à se passer du gaz russe. "Formellement, on continue d'honorer nos contrats avec la Russie, mais en coulisses cela discute avec d'autres pays, comme les États-Unis ou d'autres grands producteurs de GNL." Le port, qui a une capacité de stockage de 9 milliards de m³ de gaz naturel liquéfié, n'exclut pas d'agrandir ces infrastructures si la Belgique devait en avoir besoin." Mais on y met des conditions, annonce le directeur. Il faut que ces infrastructures soient compatibles avec le futur stockage d'hydrogène vert et de ses dérivés. On doit prévoir le futur car le GNL va lentement disparaître dans les 20 prochaines années".

Zeebruges veut ainsi se positionner comme un des principaux ports européens où transitera l'hydrogène vert. "La technologie n'est pas encore mûre. Mais il faudra sans doute amener d'énormes quantités de molécules vertes provenant d'endroits où il y a beaucoup de vent ou de soleil, comme l'Afrique du Nord, l'Australie ou la Chine." L'hydrogène, en elle-même, est très difficilement transportable sur des navires. "Elle devra sans doute être modifiée en méthanol ou en ammoniac vert avant d'être importée en Europe où elle sera "craquée" de nouveau pour obtenir de l'hydrogène pur." Ce positionnement de pôle énergétique du port brugeois était l'une des "grandes motivations" ayant conclu à la fusion, effective depuis ce jeudi, avec le port d'Anvers. "Le secteur pétrochimique anversoise aura besoin de beaucoup d'hydrogène. Dans l'autre sens, Anvers a une grande quantité de CO₂ qu'elle pourra transporter vers Zeebruges." Reste à construire un réseau souterrain pour effectuer ces échanges entre les deux ports belges séparés de 80 kilomètres. "Un projet de tracé est à l'étude. Mais ce sont des discussions difficiles car aucune commune ne veut d'un tel réseau de tuyaux sous son territoire", conclut Rik Goetinck. Raphaël Meulders

Inséré 17/05/22 NIEUWS NOUVELLES Enlevé 17/06/22

Belgian Society of Maritime Artists



INVITATION

Le Bruxelles Royal Yacht Club à le plaisir de vous inviter à l'exposition de peintures marines présentée par la Belgian Society of Maritime Artists, dans la Salle Tabarly (située à l'arrière de notre clubhouse)

Belgian Society of Maritime Artists

Exposition de Peintures Marines,
"Escale à Bruxelles"

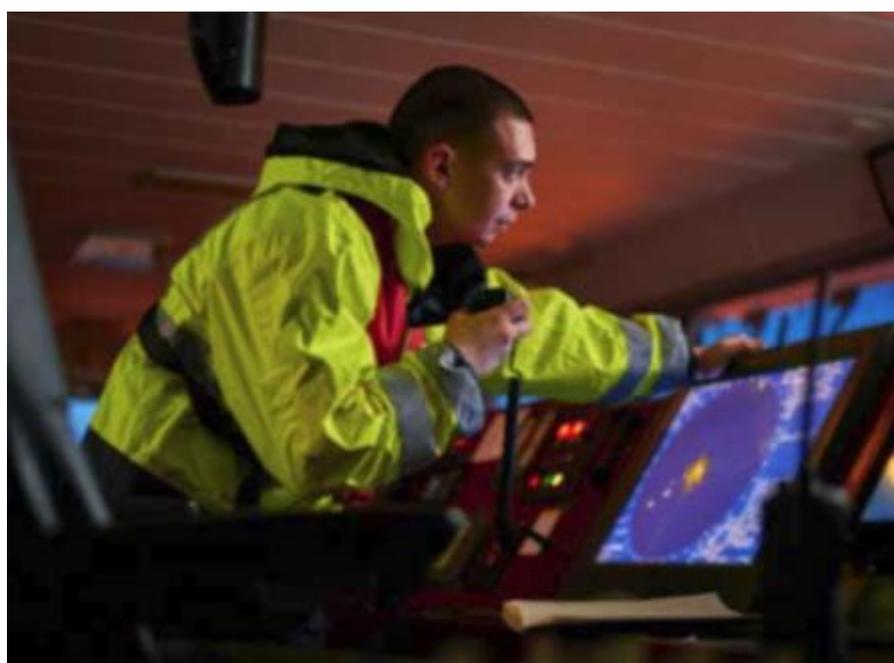
Cet événement exceptionnel aura lieu le samedi 27 mai et dimanche 29 mai prochains au BRYC
Rendez-vous * 1 chaussée de Vilvorde à 1020 Bruxelles de 11 à 18h30

Salle Tabarly - Entrée Libre

* Information pratique : Veuillez noter que la Fête du Port de Bruxelles aura lieu le dimanche 29 mai et que l'accès au clubhouse en véhicule sera interdit ce jour-là . Nous vous conseillons dès lors de vous rendre au quai de Heembeek (situé à l'arrière du port) où une navette fluviale vous emmènera gratuitement au clubhouse du BRYC d'où vous pourrez accéder à l'exposition dans notre salle TABARY

Inséré 18/05/22 DOSSIER Enlevé 18/06/22

Navigation: Why ECDIS needs a new approach



Prompted by an increasing number of grounding incidents, UK and Danish authorities have just published a major report that raises serious questions about the shipping industry's fundamental approach to electronic navigation.

New research by UK and Danish maritime authorities has set out findings that describe how the shipping industry has begun to routinely fail in its use

and management of an essential piece of navigational information technology – ECDIS (Electronic Chart Display and Information System).

ECDIS allows crews to accurately map out their voyages on screen, and, in theory at least, minimise risks – primarily grounding – along a ship's passage. Navigators who use ECDIS

are required to take specialist training to acquire necessary levels of knowledge and competence and become certificated.

Grounding incidents

The new report – Application and Usability of ECDIS – written and published by the Marine Accident Investigation Branch (MAIB) and Danish Maritime Accident Investigation Board (DMAIB), has, they say, been prompted by the increasing number of grounding investigations they have had to carry out in



recent years in which ECDIS was the primary means of navigation.

Notable incidents include the chemical tanker *Ovit*, which ran aground in the Dover Strait in September 2013 due to what an MAIB report described brusquely as “a clear example of ECDIS incompetence by deck officers”; the bulk carrier *Muros*, which ran aground on the east coast of the UK in December 2016 after ECDIS procedural safeguards were “overlooked, disabled and ignored” (we reported on this in *Marine Professional*, Troublespot December 2017); and, more recently, the general cargo vessel *Kaami*, which was declared a constructive total loss and scrapped after it ran aground in a storm in the Scottish Hebrides in March 2020 due to “ECDIS misuse”.

Catalyst for change

While the report makes no specific safety recommendations, the MAIB/DMAIB hope it will “act as a catalyst for change” within the industry, urging, as it does, improved future ECDIS design, training, and performance.

“Improvements can be made at every level,” says the report, “from the agile setting of performance standards, through human-centred design to ensure users interface effectively with complex technological systems, down to operator training and the setting of procedures and best practice.” The report’s findings are based on interviews carried out with 155 professional ECDIS users and data gathered between February and July 2018 during sea voyages in European waters on 31 ships of various types. “Despite being in service for two decades ECDIS could, at best, be described as being in its implementation phase. Specifically, most of the automated functions designed to alert the watchkeeper to impending dangers were not easy to use and lacked the granularity for navigation in pilotage waters.

“The consequent high false alarm rate eroded confidence in the automated warning, and most operators disabled the alarms or ignored alerts.

“To be an effective tool for safe navigation, ECDIS needs a high degree of operator input but many watchkeepers appeared to have limited understanding of the systems they were using, and in the main only used them to the extent they felt necessary.”



The navigation bridge of the ROLLDOCK SUN
Autonomous shipping concerns

The report also goes on to urge caution in the development and use of autonomous shipping in the near future. "Current system shortcomings, compounded by limited bathymetry data, make safe navigation challenging and do not augur well for future automation of the navigation function," it warns.

Industry wants better training

David Appleton, technical officer at the maritime trade union Nautilus, believes the report highlights an urgent need for the industry to modernise its training: "It goes without saying that cadets need to be taught traditional methods which they can use as back up in the event something goes wrong," he says. "However, we currently have a situation where cadets will spend weeks on traditional techniques and then have just a week-long ECDIS course tagged at the end of their training.

"We need to look at the emphasis to ensure that seafarers are adequately trained in the equipment they will use every single day of their careers."

Wider

discussion

The report concludes that while ECDIS does contribute to safe navigation, the challenges that have accompanied its introduction remain problematic. Some of these, it says, stem from the system's automation not always working efficiently due either to the lack of bathymetric fidelity (i.e. the provision of depth contours in the same manner as provided on paper charts) and/or human-centred design not being considered. The report's findings also point to deep-rooted, structural flaws in the way that new navigation technologies are implemented – flaws that hinder system development and the evolution of new ways of working. Addressing such key issues, the report predicts, will challenge traditional thinking and structures, and require international liaison and agreement.

What's next

The DMAIB and MAIB will now present and discuss the study with other marine accident investigation agencies to share the findings, in order to, hopefully, they say, improve how accidents involving interaction between users and complex technological systems, such as ECDIS, are investigated.

[Download and read the full report.](#)

Source : Maritime Professional

Inséré 19/05/22 NIEUWS NOUVELLES Enlevé 19/06/22

Knutsen and NYK Launch JV for Liquefied CO2 Transportation and Storage



CO2 transport Knutsen and NYK's concept for a CO2 carrier with a bow loading system (KNCC)

Japan's NYK Line and Norway's Knutsen Group, which have had a long cooperation in the operation of shuttle tankers, are launching a new company seeking to realize opportunities in the emerging transport of CO₂. Knutsen NYK Carbon Carriers (KNCC) will be a joint venture to develop and market new businesses related to the marine transportation and storage business of liquefied CO₂. KNCC, according to the companies, will provide customers with a unique competence for advanced transport including liquefied CO₂ loading and offloading onshore and offshore. Through KNCC, "we will combine our extensive knowledge of ship operation and management to achieve the early realization of not only small and medium-sized vessels but also large liquefied CO₂ vessel operations."

They plan to develop a liquefied CO₂ transport vessel using Knutsen's unique technology called PCO₂, which will enable the transport and storage of liquefied CO₂ at ambient temperature. Knutsen first developed its PNG technology more than 20 years ago and according to the companies, it will offer shippers both flexible and cost-effective solutions, whether the transportation requirement is from shore to sea or from offshore installations. Transporting CO₂ at ambient temperatures reduces the need for compression and heating that are required for cryogenic and low-temperature solutions for offshore discharge. "We are pleased to have developed a solution that is key to reaching the ambitious climate goals," said Trygve Seglem, owner and president of Knutsen Group and who will serve as vice chairman of KNCC. "Combining the PCO₂ technology with our competence and experience within offshore operations enables us to offer a safe and regular marine transportation of liquefied CO₂." The goal is to realize the operation of large liquefied CO₂

transport vessels at an early stage in the development of CO2 capture and storage. In the future, KNCC will also consider developing other low-to-medium pressure liquefied CO2 transport vessels using future technologies. Svein Steimler, President and CEO of NYK Group Europe, will be chairman of the new company. Anders Lepsøe was appointed CEO of the company. Lepsøe has extensive experience in the oil and gas, financial, and shipping industries and has a background in a wide range of international businesses.

Source : MAREX

Inséré 21/04/21 BOEKEN LIVRES BOOKS Enlevé 21/06/22

Made in Belgium by Boelwerf: alle schepen

De Boelwerf in Temse mag dan een kwarteeuw geleden teloor zijn gegaan, de erfenis van het bedrijf blijft de Temsenaren bezighouden. De vzw Op Stoapel, die het Boelwerfverleden documenteert, brengt elk schip in kaart dat er ooit van stapel liep.

Het nieuwe boek 'Made in Belgium by Boelwerf' brengt de volledige productie van de werf uit Temse in beeld - ©



"Het boek is gebaseerd op een bouwlijst van alle schepen die ooit op de Boelwerf werden gebouwd", zegt Lieven Muësen van vzw Op Stoapel. Die gegevens in kaart brengen was niet eenvoudig, maar na lang speur- en vergelijkingswerk kwam er een geperfectioneerde bouwlijst. Blijft de vraag hoe je van die omvangrijke lijsten een leesbaar boek maakt.

"Op de linkerpagina vind je het bouwnummer, op de rechterpagina foto's uit het Boelarchief, van Op Stoapel en Rijksarchief Beveren", zegt Muësen. "De beelden worden geflankeerd door verhalen die werden aangereikt door leden van de vereniging. We hebben gezorgd voor een toegankelijke, luchtige toon zonder te veel technisch jargon dat niet-

kenners zou afschrikken. Het boek is zo opgevat dat je het af en toe even kunt openslaan en dat je kunt grasduinen tussen de beelden en verhalen."

Gezamenlijk werk

Een auteursnaam zul je op de omslag niet aantreffen. "Het is het resultaat van een gezamenlijke inspanning", zegt Muësen. "Eddy Van Grevelinge is bijvoorbeeld al sinds 2014 met de scheepslijsten bezig, ik heb een groot deel van de teksten bij elkaar gezocht, maar het eindresultaat is het werk van vele handen."

Naar de aanleiding van het tweehonderd bladzijden tellende boek is het niet ver zoeken: vijftientig jaar geleden ging de Boelwerf overkop. Afgelopen voorjaar organiseerde Op Stoapel al een [expositie](#) over de geschiedenis van de werf. Het boek is daar een verlengstuk van, maar mikt op een wat breder, misschien wel internationaal publiek.

Op tijd bestellen

'Made in Belgium by Boelwerf' wordt voorgesteld op de nieuwjaarsreceptie van Op Stoapel vzw op zaterdag 11 januari 2020 om 14.00 uur in wijnbar De Correctie, Cauwerburg 115, 9140 Temse. Het boek zal daar te koop zijn voor 35 euro. Het kan vanaf die dag ook besteld worden door 35 euro over te schrijven exclusief 7 euro verzendingskosten, op rekeningnummer BE46 7370 3974 0236 van Op Stoapel vzw met vermelding van 'MIBB', uw naam en afleveradres. Leden van Op Stoapel kunnen het boek aankopen voor 30 euro op vertoon van lidkaart en indien er niet is vooringetekend (max. een boek per lid).

Het boek kan gekocht en afgehaald worden bij enkele bestuursleden. Daarvoor neemt u contact op met Op Stoapel via info@opstoapel.org of 0473 47 60 50 (Eddy Van Grevelinge), 0486 89 76 85 (Lieven Muësen), 0496 12 24 03 (Paul Bertolo). Michiel Leen

Inséré 21/05/22 DOSSIER Enlevé 21/06/22

Will floating windfarms be the saviour of the AHTS market?

by John Snyder

The growing number of floating wind projects could boost AHTS demand, but will it be enough to drive a significant improvement in utilisation? MSI senior offshore analyst Ferenc Pasztor investigates.

The first decades of the offshore oil and gas industry are a story of shallow-water, near-shore production platforms with structures fixed to the seabed, increasing in size year after year. The appearance of floating platforms was a step change, helping to commercialise deepwater investment and open up prolific production basins. We are witnessing the genesis of a similar transition in the offshore wind sector.



The **HAWK** (ex *Terasea Hawk*) navigating the Singapore Strait

After years of successful proof-of-concept floating wind projects, large-scale commercial projects are closer than ever to being green-lighted. In recent months, Total and Macquarie's Green Investment Group have formed a partnership to develop five floating wind projects with a total capacity of 2 GW starting in 2023 offshore South Korea. To generate electricity on this scale, hundreds of floating wind turbines will be required.

Not only has the area of potential offshore wind projects increased considerably with the new technology, but so has the way in which those turbines are installed. Instead of assembling various components at the offshore windfarm, floating turbines can be fully assembled at a construction yard and then towed to the site.

While fixed-foundation windfarm projects face supply chain bottlenecks with the requirement for massive wind turbine installation vessels (WTIV), at least until the next wave of supply becomes available, for floating wind there is an ample supply of high-capacity anchor handling tug supply (AHTS) vessels that can provide both the towing and anchor handling services needed to perform the yard-to-site installation of floating wind turbines.

AHTS availability has been exacerbated by the well documented offshore downturn. The 2014 oil price collapse and subsequent weak recovery ended abruptly with the current pandemic. The resulting oil company budget cuts have weakened an already stricken offshore drilling industry – the major driver of AHTS demand.

AHTS owners, carrying unsustainable debt, are in a dire financial situation. Many have already gone through debt restructurings and bankruptcies. With oil and gas-driven demand expected to be weak going forward, could they turn to the renewables industry for some relief?

Turbines to be towed, anchors to be laid

Small floating wind pilot projects of recent years have offered some insight into related vessel operations and what could be required of the AHTS fleet. Although we expect towing and anchor handling to become more time efficient in the future, we think the vessel

operations data already available can be reliably used to help predict future AHTS demand for floating wind work and quantify its contribution to overall AHTS demand.

For our vessel demand calculations (per turbine), we have assumed 4.5 days are required for installing the pre-lay mooring system (PLMS) at the windfarm, 3.5 days for the mobilisation and demobilisation for the PLMS installation, 7 days for towing the turbine from the construction yard to the windfarm and sailing back to the yard and 2.5 days for the hook-up of the turbine at the windfarm. In reality, each of the above have some variance and the potential to be shortened as operators gain more experience with new projects. Time spent on towing may differ significantly for actual projects, depending on the distance between the construction yard and the windfarm. Our assumption represents a scenario with a distance of 250 nautical miles. We have also taken into account mooring line maintenance of turbines in situ, with the assumption that 3 out of 100 floating turbines need a mooring line replacement per year (5.5 vessel days per such turbine). For an easier understanding of how many AHTSs will be needed for windfarm work per year in the forecast, we have converted vessel days to vessel years.



The 2009 built MAERSK LOGGER

As the first step in the analysis, we have made a forecast for the first half of the decade, as that period has relatively good project visibility based on already sanctioned developments. We have also performed a long-term scenario analysis, where we assumed a 10% (low case) and a 20% (high case) year-on-year increase of the numbers of turbines installed from 2025 onwards. For calculating utilisation levels, we use the assumption that only AHTSs with capacity above 12,000 bhp would be used to serve the market.

The results of the short/mid-term forecast clearly indicate that the level of floating wind turbine installation activity is insufficient to act as a panacea for the industry's woes. Near-term, floating wind will not provide a significant lift to AHTS utilisation. The numbers start

to look more promising by the end of the first half of the decade but compared to the number of AHTS vessels that are forecast to be working in the oil and gas sector, the floating wind call on AHTS vessels will still be very limited. The long-term outlook is more positive. The addition of floating windfarms will generate a significantly higher level of vessel utilisation by the end of the decade (86% in the high case scenario) compared to a situation when only oil and gas-related demand is taken into account (79%), providing a boost to vessel owners' pricing power. There are uncertainties regarding the demand drivers of both sectors nevertheless. A faster shift from hydrocarbon to renewable energy consumption may make our oil price assumption too high and even the high case scenario of floating wind turbine installation activity too conservative. In that case, the contribution of windfarms to AHTS utilisation may be even bigger. Also, our demand calculations do not consider potential additional vessel days due to sea conditions.

For the analysis, we have kept the vessel supply assumptions (ie deliveries and scrapping) unchanged, but it is important to note that depending on market conditions, those might also change significantly, affecting utilisation levels. We can conclude that floating wind installation activity will not provide material incremental upside to the AHTS market in the near-term, and although its contribution to overall AHTS demand will be significant by the end of this decade, the story will only become exciting in the next decade.

Source : Riviera Maritime Media

Inséré 23/05/22 HISTORIEK HISTORIQUE Enlevé 23/06/22

Bearings Straight

Mercator's Résumé

Gerard Mercator was more than just a mapmaker. Although biographical dictionaries accustomed to single occupations typically treat him as merely a cartographer or a geographer, Mercator distinguished himself at various times as a calligrapher, an engraver, a maker of scientific instruments, and a publisher. No less impressive are his deep interests in mathematics, astronomy, cosmography, terrestrial magnetism, history, philosophy, and theology. Although biographers lament the lack of diaries, account books, and carefully archived personal correspondence, the historical record reveals Mercator as an introspective and energetic chap who was competent in science, honest and well liked, technically savvy and clever with his hands, curious about the world around him, successful as an entrepreneur, and well positioned to make a pair of substantial contributions to mapmaking.

Mercator's first biographer was Walter Ghim, his neighbour in Duisburg, the small German city where he lived from 1552 until his death in 1594. A twelve-term mayor of the town, Ghim contributed a short biography to the 1595 edition of Mercator's Atlas, published posthumously by his youngest son, Rumold. Ghim's essay is more a long obituary than a critical biography. The mayor praises Mercator as a "remarkable and distinguished man," notes his "mild character and honest way of life," and provides dates and other details for key events in the cartographer's career. Thus we learn that Gerard Mercator was born at approximately 6 a.m. on March 5, 1512, in Rupelmonde, Flanders, where his parents Hubert and Emerentiana were visiting Hubert's brother, Gisbert Mercator, "the energetic priest of that city." (Flanders is roughly coincident with the northern part of present-day Belgium, and as figure 3.1 shows, the village of Rupelmonde is about ten miles southwest of Antwerp.) He died "82 years, 37 weeks, and 6 hours" later—a remarkably long life for the sixteenth century—after coping in his final years with partial paralysis and a cerebral

hemorrhage. Ghim offers a detailed description of Mercator's failing health and last rites but says little about the mapmaker's early life.

Scholarly interpretations of sixteenth-century Flanders helped historian of calligraphy Arthur Osley paint a richer picture. Although Mercator's parents had little money—his father was a shoemaker and small farmer—Gisbert was at least better connected. Through his uncle's influence, Gerard was enrolled at age fifteen in the distinguished monastic school at 's-Hertogenbosch run by the Brethren of the Common Life, who accepted poor but bright boys willing to train for the priesthood. The brothers specialized in copying sacred texts, and their school excelled at teaching penmanship. In addition to learning Christian theology and Latin, Mercator developed a practical and lasting interest in the elegant italic script in which he engraved place names and interpretative text for his maps. He considered italic lettering more appropriate for scholarly writing than Gothic and other less formal (and often less legible) styles of handwriting, and in 1540 he published *Literarum latinarum, quas Italicas cursoriasque vocant, sribendarum ratio* (How to Write the Latin Letters Which They Call Italic or Cursive), a short manual that was influential in the adoption of italic lettering in cartography.



Figure 3.1 Places Mercator lived or visited (larger lettering), with present-day international boundaries and additional cities (smaller labels) as a frame of reference.

Various renderings of Mercator's name invite confusion. Although his German father apparently went by Hubert Cremer, vernacular versions of the family name include de Cremer, Kramer, and Kremer. Krämer (the modern spelling) is the German word for merchant or shopkeeper, Cremer is its Dutch equivalent, and Mercator is the Latin version, which the future mapmaker adopted at 's-Hertogenbosch. (Latin was the language of Europe's educated elite, and young scholars routinely latinized

their names.) Although Gerhard Cremer and Gerardus (or Gerhardus) Mercator might be more historically correct, American and British cartographic historians prefer the partly anglicized Gerard Mercator. A reasonable compromise, I'm sure, as an obsessive purist would need to write awkwardly about Gerardus Mercator Rupelmundanus (Gerard Mercator of Rupelmonde), the name under which Mercator enrolled at the University of Louvain in 1530 and published his epic world atlas.

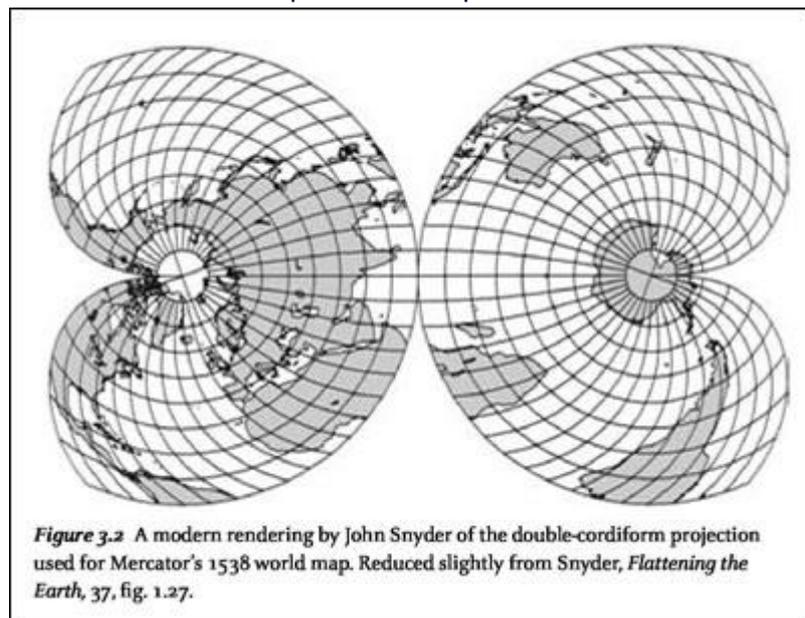
At Louvain Mercator studied humanities and philosophy, attended lectures by the brilliant mathematician and astronomer Gemma Frisius (1508–55), and received a master's degree in 1532. With his religious faith challenged by contradictions between biblical accounts of creation and Aristotle's writings, Mercator occasionally felt stifled at Louvain, where doubt was akin to heresy. He began corresponding with a group of Franciscan preachers living in Antwerp and Mechelen (see fig. 3.1), and visited them several times to discuss theology and science. His confidants included Franciscus Monachus (ca. 1490–1565), a prominent geographer who produced a terrestrial globe around 1520 and is a plausible source of Mercator's knowledge of northern lands. Although his absences from Louvain aroused suspicion, Mercator eventually resolved his concerns over the conflicting interpretations and, according to Osley, "emerged with strong Christian convictions, which remained with him."

Reluctant to leave Louvain, Mercator pursued an academic apprenticeship centuries before the modern university gave us postgraduate education. In addition to convincing Frisius to

instruct him in astronomy and geography, Mercator and his tutor persuaded Gaspar van der Heyden, a local goldsmith and engraver, to let Mercator use his workshop for making globes and scientific instruments. The three apparently collaborated on numerous projects, including maps and surgical instruments—Frisius was also a physician—and the future mapmaker either contributed to or witnessed all phases, from design to marketing. As Osley observes, by age twenty-four Mercator had become “a superb engraver, an outstanding calligrapher, and one of the leading scientific instrument makers of his time.” And as his later works attest, skill in engraving gradations and labels on brass and copper instruments proved useful in making printing plates for maps and globe gores.

An energetic learner, Mercator progressed quickly from globes to flat maps and from engraving to full authorship. In 1536 he engraved the italic lettering for Frisius’s terrestrial globe, which was assembled by pasting twelve printed gores onto a spherical papier-mâché shell nearly 15 inches (37 cm) in diameter. His role expanded from engraver to coauthor with the publication a year later of Frisius’s celestial globe, similar in size and manufacture. In 1537 he also authored and published his own map, a 17 by 39 inch (43 by 98 cm) cartographic portrait of Palestine engraved on copper and printed as six sheets, which formed a wall-size map when glued together. Mercator’s enduring interest in religion was no doubt a key motivation. Although he cites Jacob Zeigler as his principal source, the small map included with Zeigler’s book on the Holy Land, published five years earlier, is comparatively sketchy. Cartographic historian Robert Karrow, who labeled the map a “commercial success,” notes that it remained in print for at least four decades and provided the geographic details for Palestine for Mercator’s epic world map of 1569.

In 1538 Mercator published a 14 by 21 inch (36 by 55 cm) world map, laid down on the double cordiform (double heart-shaped) projection (fig. 3.2) pioneered in 1531 by the French mathematician Oronce Fine (1494–1555). Although Mercator borrowed the geographic framework from Fine, his map is more similar in content to Frisius’s terrestrial globe. As close examination of its features and place names reveals, he consulted additional sources but was the first to identify North and South America as



separate continents. Also noteworthy are the suggestion of a Northwest Passage and the separation of Asia and North America, typically attached on early-sixteenth-century world maps. Aware of the uncertainty of some delineations, he scrupulously differentiated known, previously mapped coastlines from their more speculative counterparts in areas largely unexplored.

Mercator’s next publication was a detailed 34 by 46 inch (87 by 117 cm) map of Flanders, printed as four sheets in 1540. Prepared at the urging of Flemish merchants, the map was based on precise trigonometric and field surveys. Although some historians attribute the measurements to Mercator, who no doubt engraved the copper plates, others question whether the impoverished artisan had the time and resources for extensive fieldwork during the harsh winters of 1537–38 and 1539–40. A key skeptic is Rolf Kirmse, who observed that the distances portrayed are off by only 3.4 percent on average and that the average error of the angles is a mere 2° 20'. According to Kirmse, the timing of the surveys and their high level of accuracy point to Jacob van Deventer (ca. 1500–1575), a Dutch mapmaker who lived in Mechelen in the late 1530s and later produced a unique collection

of town plans of the Netherlands for the king of Spain. Whoever the surveyor, there is no dispute about the map's success and influence. Among the fifteen subsequent editions published between 1555 and 1594 is a smaller adaptation included in the 1570 world atlas by Abraham Ortelius (1527–98), a genial contemporary of Mercator.

In August 1536 Mercator married Barbara Schellekens, and the following year Barbara gave birth to their first son, Arnold. The couple eventually had six children, three boys and three girls. All three sons became mapmakers for a time at least, and Rumold (ca. 1541–1600), their youngest, became his father's representative in England and supervised publication of the first complete edition of the Mercator world atlas.

Although prosperous and comparatively erudite, sixteenth-century Flanders was frequently engulfed in conflict between Protestant reformers and Catholic traditionalists, who in 1544 began a brutal effort to suppress Protestantism. Mercator's letters to the friars in Mechelen as well as his more recent travels attracted the attention of religious extremists, who imprisoned him at Rupelmonde in March 1544. The zealots also held forty-two other suspects, including Joannes Drosius, to whom Mercator had dedicated his 1538 world map. Although protests by the mapmaker's friends, colleagues, town officials, and a local priest won his release seven months later for lack of evidence, four of his fellow detainees were beheaded, burned at the stake, or buried alive.

Mercator's religion remains ambiguous. Some writers consider him a Protestant (possibly a Lutheran convert), while others insist he remained a committed Catholic. Ghim and Osley ignore the mapmaker's church affiliation altogether, Karrow confesses uncertainty, and the late Richard Westfall, who compiled the entry on Mercator for the Catalog of the Scientific Community Web site, emphatically states, "I find it impossible to tell." Mercator was released from his imprisonment into Catholic territory, Westfall notes, but eight years later he left Louvain for Duisburg, in Cleve (a German duchy about fifty miles east of Flanders), which was Protestant. Even so, Catholic patrons continued to sponsor his projects and buy his maps.

Although religious unrest or outright persecution might have precipitated the move, the immediate incentive was a job offer from William, Duke of Cleve, who planned to open a university in Duisburg. Although the duke's academy never developed, royal and commercial patrons continued to underwrite Mercator's globes, maps, and scientific instruments. Especially significant is his 1554 map of Europe, which he started in Louvain. Engraved in copper and printed as fifteen separate sheets, the entire map measures 47 by 58 inches (120 by 147 cm) and, according to the ever enthusiastic Walter Ghim, a revised edition published in 1572 "attracted more praise from scholars everywhere than any similar geographical work which has ever been brought out."

The 1554 edition's portrayal of Britain underscores the difficulty of obtaining accurate geographic information about a country that feared invasion. According to Peter Barber, the British Library's expert in medieval and early modern maps, Mercator relied heavily on existing maps, including a 1546 map of England published in Rome by George Lily, as well as reports from various unnamed correspondents, including the British astronomer-mathematician John Dee, who lived in Louvain from 1538 to 1540. Although his correspondents helped him add place names and refine coastlines, Mercator's treatment does not mirror the markedly more accurate geometry of unpublished British surveys of the late 1540s and early 1550s. More surprising is the omission of several bishoprics that Henry VIII had established after he broke with Rome—surprising because Mercator, now living in Duisburg, had little to fear from church authorities. In Barber's view, the omission reflects either ignorance of the bishoprics or a reluctance to antagonize a generous supporter, Cardinal Granvelle, to whom Mercator dedicated the map.

More impressively accurate is Mercator's 1564 map of England, Scotland, and Ireland, printed on eight sheets, which compose a 35 by 50 inch (88 by 127 cm) wall map. A curious inscription attributes its content to a prototype mysteriously acquired from an anonymous acquaintance. According to Ghim, "a distinguished friend sent Mercator from England a map of the British Isles, which he had compiled with immense industry and the utmost accuracy, with a request that he should engrave it." Neither Mercator nor Ghim named the

source, whose identity sparked the curiosity of map historians who, as Barber tells it, eagerly enlisted in a game of “find the friend.” After analyzing place names, shapes, and other details together and carefully assessing information available to plausible informants, Barber attributed the draft to John Elder, a Scottish Catholic who traveled freely between England and mainland Europe. Elder had access to the Royal Library, where he apparently compiled the map from ostensibly top-secret drawings by English surveyors. According to Barber’s hypothesis, Elder left England in late 1561, amid growing hostility between the Catholic and Protestant supporters of Mary Stuart and Elizabeth I, and gave the map to Cardinal de Lorraine, who persuaded Mercator to make the engraving.

Although powerful patrons like the Cardinal no doubt initiated specific projects, serendipitous influences were at least equally important. For example, Mercator’s famous 1569 world map, discussed in greater detail in the next chapter, was at least partly encouraged by his appointment to teach mathematics, as a part-time volunteer, in the gymnasium (high school) established by Duisburg’s city council in 1559. Mercator designed a three-year course that included geometry, surveying, and mathematical astronomy, and he taught the entire sequence once before surrendering the position to his second son, Bartholomew. A second example is his appointment around 1564 as cosmographer to the Duke of Jülich, Cleve, and Berg. According to Karrow, this nomination inspired Mercator to plan an enormous series of works on geography, cosmography, and history. The first part to be published was the *Chronology* (1569), an attempt to establish an accurate framework for world history. The *Chronology* included tables of solar and lunar eclipses and a conscientiously researched chronological list of political, cultural, scientific, and biblical events. Committed to completeness, Mercator earned a place on the Church’s list of banned books by including events associated with Martin Luther and a few other heretics.



Figure 3.3 Based on a 1574 portrait, this elegant engraving of Gerard Mercator measuring a globe was first printed in the 1584 edition of Ptolemy’s *Geography*. It also appeared in the 1595 edition of Mercator’s *Atlas*. From Averdunk and Müller-Reinhard, “Gerard Mercator,” frontispiece.

As a second instalment of his vast, comprehensive work, Mercator published an authentic version of Ptolemy’s *Geography*, deliberately devoid of the distracting interpretations and misinterpretations by earlier editors intent on improving the Egyptian geographer’s seminal work. Mercator’s goal was an accurate portrait of Ptolemy’s second-century view of the world. To understand the present, the mapmaker believed, one must appreciate the past. The atlas, published in 1578, included Ptolemy’s twenty-seven maps, carefully restored, handsomely engraved, and supplemented by an index of place names and an enlarged boundary map of the Nile Delta. The maps vary slightly in size, with the typical display measuring approximately 13 by 18 inches (34 by 46 cm). Seven subsequent editions, published between 1584 and 1730, attest to the book’s importance to scholars. An engraved portrait of Mercator holding a globe and

dividers (fig. 3.3) suggests that the mapmaker, now in his seventies, had become a brand name in geographic publishing.

While working on Ptolemy's Geography, Mercator had started to compile maps for his celebrated world atlas, which would provide the modern geographical component of the massive treatise he envisioned. Resolving discrepancies between sources and engraving most of the plates himself was a slow process, especially for a seventy-year old mapmaker. Trading off delay and fragmentation, he published *Atlas sive Cosmographiæ Meditationes de Fabrica Mundi et Fabricati Figura* (Atlas, or Cosmographic Meditations on the Fabric of the World and the Figure of the Fabrick'd) in three instalments: a 1585 edition, with 51 maps focused largely on France, Germany, and the Low Countries; a 1589 volume, with 23 maps taking in Italy and Greece; and the complete, 1595 edition, which reprinted the 74 maps issued earlier and added 28 new maps covering most of the remaining parts of Europe.

Because the atlas lacks detailed maps of Spain and Portugal, "complete" is misleading. Mercator no doubt desired a more comprehensive treatment of Europe, but time was running out. Weakened by strokes in 1590 and 1593, he died on December 2, 1594, leaving completion to his son Rumold and grandsons Gerard, Johann, and Michael. In addition to supervising printing, Rumold authored a world map and a regional map of Europe, Gerard signed regional maps of Africa and Asia, and Michael contributed a map of America. The project also provided employment for local artisans, who hand-coloured the maps. Like other mapmakers, Mercator relied on colourists, mostly women, to enhance his otherwise bland line engravings.

What took so long? The late Clara LeGear, an atlas authority at the U.S. Library of Congress, identified four impediments: Mercator's need to support himself with other projects, the difficulty of obtaining reliable geographic details, the slow pace of meticulous map engraving, and a shortage of skilled copperplate engravers. Mercator not only compiled all the maps for the atlas but also engraved the printing plates, with only occasional help from his grandson Johann and Frans Hogenberg, a skilled artisan who engraved most of the seventy maps for *Theatrum Orbis Terrarum* (Theater of the Whole World), published in 1570 by Abraham Ortelius, a publisher and map seller living in Antwerp.

Although a competitor, Ortelius was also a close friend of Mercator. So close, according to Walter Ghim, that Mercator deliberately delayed his own atlas. As Ghim tells it, Mercator "had drawn up a considerable number of models with his pen" and could easily have had them engraved. Yet he held up publication until Ortelius "had sold a large quantity of *Theatrum* ... and had subsequently increased his fortune with the profits from it." A nice story, perhaps, but the tedium of map engraving as well as the fifteen years between *Theatrum* and the first instalment of Mercator's Atlas suggests Ghim was spinning a yarn. In pioneering the notion of a consciously organized book of mainly maps with a standard format printed in uniform editions of several hundred copies, Ortelius has a stronger claim than Mercator to the title Father of the Modern World Atlas. According to map historian Jim Akerman, the innovative ingredient was *Theatrum's* structure, not its format. After all, bound collections of portolan charts copied by hand had been around for more than a century, and books of printed maps published by Martin Waldseemüller (1470–1522) and others in the early sixteenth century clearly qualify as atlases. What is noteworthy is Ortelius's demonstration of atlas making as a systematic process orchestrated by an editor who selects information, standardizes content, and maintains quality.

Ortelius and Mercator had decidedly different views of the editor's role. Whereas Ortelius relied largely on readily available sources, which he selected for reengraving, Mercator energetically sought new source materials and authored original maps, which he personally designed and engraved. Unencumbered by this spirit of scholarship, *Theatrum* not only beat Atlas onto the market but was so much more successful at the outset that Akerman considers it "remarkable that Mercator's name [for a book of maps] should have eventually triumphed."

Remarkable perhaps, but hardly inexplicable. The "Atlas" of Mercator's title commemorates an ancient ruler of Mauritania. In classical mythology, the immortal Atlas was forced to atone for his role in an unsuccessful revolt by supporting the heavens on his shoulders. In Mercator's interpretation, Atlas was really a mere mortal magnified to legendary proportions for his accomplishments in science and philosophy. Although Mercator's mythology is questionable, Atlas as a geographer and cosmographer provided an appropriate visual metaphor for the title page (fig. 3.4) of a massive work based on the hard work and persistence of the first truly hands-on atlas editor. As a word for a book of maps, atlas might have vanished shortly after Mercator's grandsons brought out a second complete edition of the Atlas in 1602. Apparently disappointed by sales, they sold the plates to the family



Figure 3.4 The title page of Mercator's 1595 Atlas honors the mythic Atlas.

of Jodocus Hondius (1563–1612), who ran a successful engraving and publishing business in Amsterdam. Hondius and his sons had a two-fold strategy for challenging the less meaty but still popular Theatrum. In 1606 they published a new, more geographically complete edition with forty additional maps. Recognizing the value of a brand name, Hondius listed Mercator as the author and himself as the publisher. A contrived engraving of the two collaborators seated at a table with globes and dividers (fig. 3.5) reinforced the continuity. To lower the cost of engraving, printing, and hand colouring, the Atlas maps, which measured about 14 by 18 inches, were simplified and reengraved to roughly 7 by 9 inches and published as the Atlas minor, a less expensive version introduced in 1607 and modelled after pocket-sized editions of Ortelius's Theatrum. Translation of Mercator's Latin narrative into Dutch, French, German, and English created a still wider market for the thirty editions of the full-size Mercator-Hondius Atlas published between 1606 and 1641. The Atlas minor enjoyed an even longer run in the twenty-five editions Hondius and his successors published between 1607 and 1738. By 1700 numerous other publishers were issuing atlases, and the term was well established.



Figure 3.5 In the expanded edition of Mercator's *Atlas* published in 1606 by Jodocus Hondius and his sons, this engraved portrait of Mercator and Hondius signified the merger of two important cartographic trademarks. From Averdunk and Müller-Reinhard, "Gerard Mercator," pl. 18.



Figure 3.6 An excerpt from Mercator's map of Brabant, Jülich, and Cleve showing Duisburg (bottom center) and part of Cleve, as portrayed in the electronic edition of his 1595 *Atlas* published in color by Octavo, "Examine Disc," 155.

Perhaps the most compelling evidence of the *Atlas's* endurance is its recent republication in CD format. In 2000 Octavo Digital Editions, an Oakland, California, firm headed by software designer John Warnock, issued a two-disc facsimile edition easily navigated with Adobe Acrobat Reader, the widely used electronic page-viewing application that Warnock helped develop. The "Read Disc" links Mercator's Latin text to an English translation and includes insightful commentary by map historian Robert Karrow. The "Examine Disc" consists of high-resolution scans of a copy in the Lessing J. Rosenwald Collection of the Library of Congress. Readers can turn the pages of the 1595 *Atlas*, peruse its maps, and zoom in for a detailed look at the mapmaker's conception of late sixteenth-century Europe. Figure 3.6, a close-up centred on Duisburg, where the mapmaker lived, illustrates the content and graphic detail, but the Octavo images, in full colour, convey a fuller sense of the hand colouring and textured paper. Warnock's version also exemplifies the extension during the 1990s of the word atlas to include structured collections of viewable geographic data

published on CDs or the Internet. Mercator's simple five-letter word apparently expresses the concept more effectively than the tedious synonym geospatial database.

Inséré 25/05/22 NIEUWS NOUVELLES Enlevé 25/06/22

Belgische marine viert 75-jarige bestaan.

De Marinecomponent van de Belgische Defensie vierde op woensdagavond 18 mei 2022 haar 75-jarige bestaan met een vlootparade van negen fregatten voor de rede van Antwerpen. Het mooie weer zorgde voor veel kijklustigen. Ook Koning Filip schouwde de vloot.



verjaardagsfeest stond eigenlijk al gepland voor juni 2021, maar toen werd het op de valreep door covid uitgesteld en verplaatst naar mei 2022. Koning Filip schouwde de vloot vanop het terras van de Royal Yacht Club op Linkeroever. Tijdens het passeren weerklonken enkele kanonschoten.

75 jaar

Door historische ontwikkelingen is de Belgische marine nog maar 75 jaar oud. Op 1 februari 1946 richtte de regering, bij Regentsbesluit van 30 maart 1946, de Zeemacht op. De Belgische marine heeft haar hoofdbasis in het Kwartier Marinebasis Zeebrugge. Verder zijn er bases in Sint-Kruis (Brugge), Antwerpen en Oostende.

Nieuwe fregatten

In 2020 werd bekend dat de zogenaamde M-fregatten worden vervangen. De hoofdtaak van de nieuwe fregatten wordt het bestrijden van onderzeeboten op afstand. De Nederlandse marine krijgt het eerste fregat naar verwachting in 2028 en het tweede in 2029. De twee vergelijkbare Belgische fregatten worden uiterlijk in 2030 geleverd.

Op rechterover was de kade goed gevuld met kijklustigen. Toch waren ook veel toeschouwers niet meteen op de hoogte van het gebeuren. De overzet werd even gestremd tussen beide oevers wat voor gemor zorgde bij enkele aanwezigen.

Schepen bezoeken

Morgen vrijdag 20 mei, zaterdag 21 mei en zondag 22 mei is er een bezoek mogelijk aan de schepen, die afgemeerd zullen liggen ter hoogte van het Steen in Antwerpen. Uren: vrijdag 20 mei van 14.00 uur tot 18.00 uur, zaterdag 21 mei 10.00 uur tot 12.00 uur en van 13.00 uur tot 18.00 uur, en zondag 22 mei 10.00 uur tot 12.00 uur en van 13.00 uur tot 18.00 uur. Kinderen kleiner dan 1m20 zijn niet toegelaten aan boord om veiligheidsredenen.

Het maritieme dorp zal opgesteld staan aan de Orteliuskaai, tussen het Loodswezen en het Noorderterras. De bezoekers kunnen terecht op verschillende standen van de Belgische marine. De scheepvaartpolitie en douane zullen, samen met verschillende firma's uit de maritieme wereld, ook vertegenwoordigd zijn. Daarnaast zullen de geïnteresseerden verschillende demo's krijgen, met virtual reality en een demo van een duikcontainer.

Inséré 26/05/22 NIEUWS NOUVELLES Enlevé 26/06/22

Norsepower announces the installation of Rotor Sails on the world's largest short sea ro-ro vessel



Norsepower has announced an agreement signed with CLdN, the logistics specialist for road, sea and rail, to install two tilting Rotor Sails on board a 2018-built Ro-Ro vessel to improve ship fuel efficiency and carbon emissions reduction. Preparations are currently taking place with the installation anticipated to be completed by December 2022.

The MV **DELPHINE**, a vessel with a cargo capacity of close to 8,000 lane meters, transits between the UK, Ireland and Europe and is the largest short sea Ro-Ro vessel operating in the world today. With two 35mx5m Rotor Sails, Norsepower has estimated that the technology would achieve a fuel and emission reduction saving of between 7 to 10% for this vessel, depending on the route. The Norsepower Rotor Sail Solution - which can be installed on new vessels or retrofitted on existing ships - is a modernised version of the Flettner rotor, a spinning cylinder that uses the Magnus effect to harness wind power to thrust a ship. At the time of contract signing, this will be the seventh vessel to be installed with Norsepower's Rotor Sails.

Tuomas Riski, CEO, Norsepower, commented on the agreement: "Seeing the interest grow in our tilting Rotor Sail design demonstrates how the industry is looking for proven, flexible solutions to lower greenhouse gas emissions and reduce fuel costs across a range of vessel sizes and operations. "Norsepower's Rotor Sail installation on the **MV DELPHINE** demonstrates how the use of clean technology can modernise and evolve the performance of fleets' younger vessels to manage emissions and help to increase asset value. With fuel becoming increasingly expensive, making savings will also have a huge impact on commercial success. Working with CLdN and its ambitious team is an opportunity to demonstrate what our technology has to offer to continue strengthening the environmental and commercial performance of its fleet."

Gary Walker, COO Shipping, CLdN, added: "In 2021, CLdN announced it is the top performer amongst its Ro-Ro shipping peers in Northwest Europe for CO2 emissions per tonne of freight carried. By investing in technologically advanced ships and terminals, CLdN enables its customers to improve their carbon footprint and support them at the same time in making their supply chains more efficient and robust. This demand for cleaner shipping is growing and we are committed to making measurable progress. Installing two of Norsepower's Rotor Sails will maximise our fuel and emissions savings on the MV Delphine, and this pilot project will help determine how the Rotor Sail technology could be rolled out on the current CLdN fleet and our new-build vessels. We look forward to the installation and subsequent results."

The Norsepower Rotor Sail is the first third-party verified and commercially operational auxiliary wind propulsion technology for the global maritime industry. The solution is fully automated and detects whenever the wind is strong enough to deliver fuel and emission

savings, at which point the Rotor Sails start automatically. This is the third installation of the tilting Rotor Sail function, highlighting the growing interest in the flexibility of the latest design.

Inséré 27/05/22 DOSSIER Enlevé 27/06/22

Cargo claims related to tank coating

An increase in insurance claims related to tank coatings has led IUMI's Joint Hull Committee to form a subcommittee to investigate. Surveyor Paul Hill explained the issues

There has been an increase in insurance claims, or 'losses', relating to tank coatings, said Paul Hill, Managing Director, Marine at consultancy AqualisBraemar.

He was speaking at the International Union of Marine Insurance (IUMI) Annual Meeting held online during September.

In these claims, an important question for insurers, and shipowners, is whether the shipowner could be considered "grossly negligent", and so themselves to blame for any damage to the cargo, because of how the coating was applied or looked after, he said.

Mr Hill is a member of the IUMI Ocean Hull committee, which recently formed a subcommittee to investigate tank coatings losses, and produce guidance notes, he said.

Coating outline

Most tankers have tanks made with mild steel and a coating. Another option is stainless steel but that is "probably too expensive for a lot of shipowners," he said.

The coating on mild steel is commonly referred to a "paint" – but this can be a misleading term. "Paint is what we paint our living rooms, cars with. What we use on ships is a coating system, far more sophisticated products, a sophisticated engineering system," he said.

The coating prevents rust forming on the steel, but broken down coating can itself contaminate the cargo.

Ships are traditionally coated with epoxy coatings, which are usually applied in two parts. Types include pure epoxy, polyisocyanate epoxy and phenolic epoxy. "The data shows that most ships built in the last 10 years have this sort of coating."

It is the "cross link density" between molecules in the coating which provides the resistance to cargoes. This is lowest for pure epoxy and highest for phenolic epoxy.

There are also "high end coatings," including siloxirane, biomodal, and solvoirane, sold by companies such as Marine Line, International Paints and Jotun, he said.

"They have low cargo absorption, they don't need so much cleaning and drying," he said.

"They have extended chemical resistance."

It means they can carry a greater variety of cargoes, and there are less restrictions on which cargo can follow another one. It also means that the coating is easier to clean and dries faster after cleaning.

However the coatings can require more surface preparation before they are applied, and have stricter humidity and temperature restrictions when they are applied.

Shipowners normally only use an expensive coating when the specific cargo they are planning for the vessel would require it, he said.

Coating manufacturers provide lists of products that a tanker with their coating is able to carry, put together from laboratory testing.

Application and maintenance

Before a coating is applied, steel surface preparation is of "paramount importance". The mild steel needs to be blasted to a certain standard. It must be clean but not totally smooth, because some roughness is required to allow the coating to bond to the steel, he said.

After the application, the coating may need curing. This is slightly different to drying, it is about the solvent being evaporated. The curing is considered complete when the coating reaches its "optimum hardness," which can be weeks later. Heating can make the process go faster.

A shipyard will provide the shipowner with a technical file with records of all aspects of the coating process. This file will be consulted if there is any investigation later.

During operation, the coating needs to be cleaned when the cargo is changed, usually with high pressure, high temperature water.

To know how a coating needs to be cleaned, and how much time is needed to dry, shipping companies could refer to sources such as the coating specification, instructions from charterers, or tank cleaning guides such as Dr Verwey, he said.

Common problems

Coating problems can occur before delivery of the ship, in the first year of service, and later on during life.

The most common problem seen before delivery of the ship, according to Mr Hill's experience as a surveyor, is "delamination" of the coating (layers of the coating separating).

During the first year of service, the most common problem is blistering and cracking.

After 1-10 years you might see 'cathodic disbondment', which means loss of adhesion between the coating and metal due to a cathodic reduction reaction at the interface of coating, and delamination, described above.

After 10-25 years of service you see the above plus "stress concentration", cracking as the coating ages.

Much of this is linked to poor surface preparation right at the outset, he said. There can also be problems from an inconsistent coating application. If the vessel is in a part of the world with extreme temperature and humidity conditions, "they need to be managed properly".

In service, problems arise from poor tank cleaning methods. "The procedures I've described need to be followed. If they're not followed this can result in premature coating breakdown." For example, companies not following washing or drying procedures, carrying cargoes which are not compatible with the coating, or having an "incorrect" cargo cycling sequence.

Another source of problems is poor maintenance by crew. "The crew do their best as always, if there are isolated areas of breakdown, blistering, the crew will get the tin of paint and patch it up. That needs to be done properly."

It is the owner's responsibility to select the right vessel design, the right coating product, and ensure correct application of the coating. "It is prudent for owners to have their own paint inspector, or a superintendent with that experience," he said.

If a cargo owner thinks their cargo has been contaminated, they submit a claim, and a surveyor is sent to make an assessment. The surveyor will look at the coating technical file, records of the cleaning operation, and the shipowner's procedures.

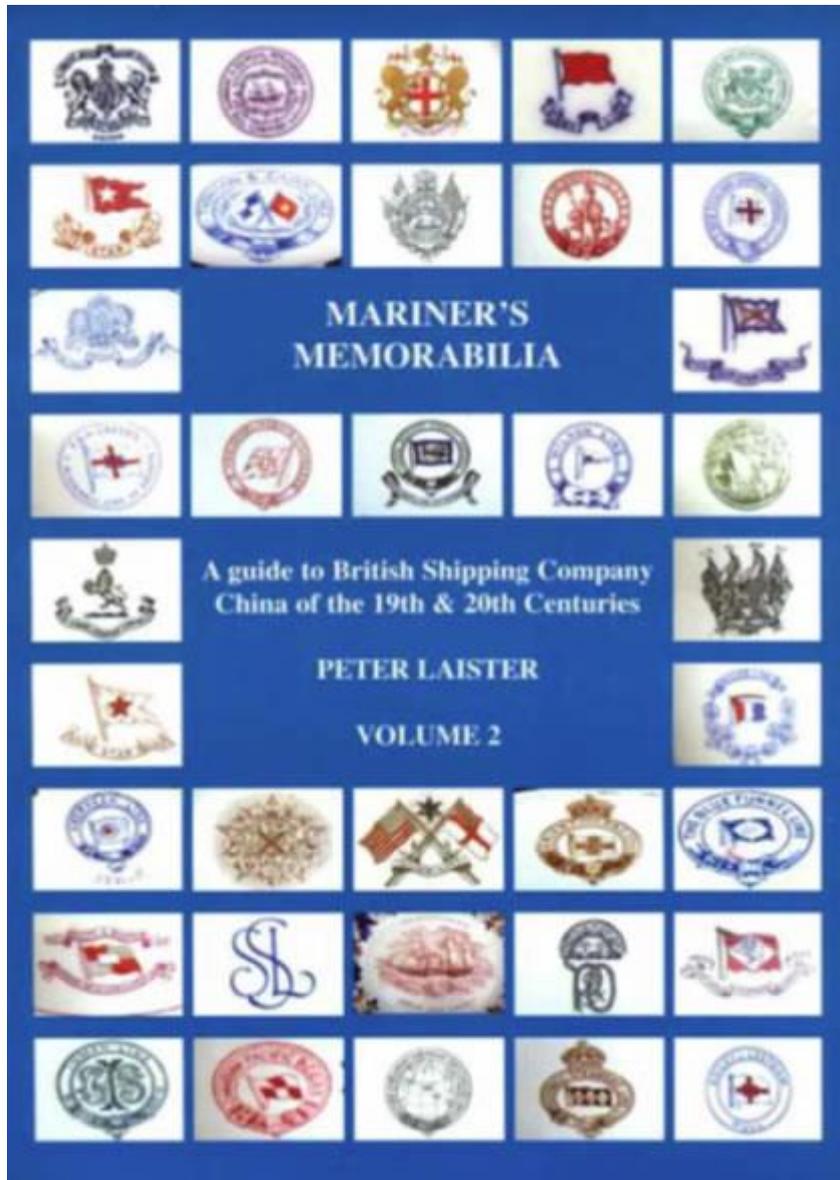
Shipowners are sometimes reluctant to hand over files to surveyors acting for others. But once they have done this, this audit is "relatively easy" and something which could be done remotely, he said.

"Even the most experienced operators don't follow the procedures totally, there are shortcuts taken," he said.

Inséré 29/05/21 BOEKEN LIVRES BOOKS Enlevé 29/06/22

“Mariner’s Memorabilia. Volume 2”

BOOK REVIEW By : Frank NEYTS



In the last few months Coastal Shipping Publications published already three volumes in a series of four entitled 'Mariner's Memorabilia. A guide to British Shipping Company China of the 19th and 20th Centuries'. All volumes are written by Peter Laister.

This book illustrates examples of china and crockery used on board British merchant ships and covers the period from the beginning of the 19th century to the end of the 20th century. It gives brief historical details of the companies themselves, and the trades in which they were involved. Information about identifying patterns of china and details of the manufacturers, are included. It also covers the difficulty of identification of china that is only marked with a monogram, initials, or a house flag.

A total of 115 companies are dealt with individually and, in total, 495 companies are mentioned in the comprehensive index. These companies were so important to the lifeblood of the United Kingdom and traded to all parts of the world. Sadly, with one or two rare exceptions, they now remain only in memory.

Whilst the name "British" forms part of the title, the book also includes shipping companies that were owned in Australia, Canada and New Zealand, these companies being of great importance to, what used to be the British Empire.

Both the author and his wife are ex. seafarers and met on the Union-Castle Mail Steamship Company's vessel, "STIRLING CASTLE", on the weekly mail service from Southampton to Cape Town in the 1950's, when he was a Deck Officer and she, a Children's Hostess.

The books offer a nostalgic inside view in British Merchant Shipping in the glory days gone by! Like all books issued by Coastal Shipping Publications, value for money!

"Mariner's Memorabilia. Volume 2" (ISBN 0-9554058-1-5) is a softback book, lavishly illustrated. The price is £12.00 plus £1.70 UK postage and £5.00 overseas postage. Ordering via all good bookshops, or directly via the publisher, Coastal Shipping, 400 Nore Road, Portishead, Bristol BS20 8EZ, UK. Tel/Fax: +44(0)1275.846178, www.coastalshipping.co.uk, e-mail: Bernard@coastalshipping.co.uk. Alternatively it can be purchased at all good bookshops.

Inséré 29/05/22 NIEUWS NOUVELLES Enlevé 29/06/22

A Greener And More Ambitious EU Maritime ETS Emerges

On 14 January 2022 the European Parliament's Rapporteur, MEP Peter Liese, published his draft report on a proposal to revise the Emissions Trading System (ETS) Directive¹ which forms part of the 'Fit for 55' package of climate and energy reforms published on 14 July 2021. The draft report includes a number of ambitious amendments to emissions trading for the maritime sector – the Maritime ETS – which, if agreed, will put more pressure on the maritime industry to switch to cleaner fuels sooner than originally planned. Further amendments are expected to be submitted in response to ongoing feedback from businesses in the coming weeks. We will produce a more detailed article as these progress to their final form.

"The latest set of amendments to EU Maritime ETS proposal will, if agreed, put more pressure on the maritime industry to switch to cleaner fuels sooner than originally planned."

WHAT KEY AMENDMENTS ARE RECOMMENDED TO MAKE MARITIME ETS GREENER?

Whilst the underlining principle of the Maritime ETS proposal (as discussed in our October 2021 article) is consistent with the 'polluter pays' principle, there are a number of significant changes to the definitions, scope, phase-in periods and thresholds which are being proposed in the draft report:

- Full reporting on emissions to commence in 2025: Shipping companies will have to surrender 100% of their verified emissions allowances a year earlier than originally proposed. The justification for this amendment is that a shorter phase-in period will indirectly increase the number of allowances available for other industries. Also, in place of reporting 20% of verified emissions in 2023, 45% in 2024 and 70% in 2025, as originally proposed, the draft report calls for more ambitious action by recommending that shipping companies report on 33.3% of verified emissions for 2023; 66.6% for 2024 and 100 % for 2025 and each year thereafter. Moving the date of full application forward by one year, from 2026 to 2025, will apparently make around 57m allowances available to other industries caught by the ETS which would otherwise have been cancelled under the Commission proposal;
- 100% of non-EU emissions from ships calling at EU ports to be caught if IMO fails to introduce a similar global measure by 2028: As only 50% of non-EU voyages are covered in the original draft Maritime ETS proposal, the draft report recommends that the Commission and Member States should foster international cooperation to finally cover 100% of non-EU voyages. The draft report calls for 100% of the emissions from ships over 5,000 gross tons performing voyages between EU and third country ports to be covered by ETS. The draft report notes that capturing all of the non-EU emissions will only become a necessity if the IMO fails to adopt a global based measure by the 2028 global stocktake deadline for the wider EU ETS and no later than 30 September 2028;
- 'Time charterers' now expressly included in the definition of 'Shipping Company'. The

definition of 'shipping company' is amended to include a 'time charterer';

- ETS responsibility and payment of final price to fall on the commercial operator who may not always be the Shipping Company: The draft report recommends that a binding clause should be included in contractual arrangements between parties which ensures that ETS responsibility and payment of ETS costs would fall on the entity that is ultimately responsible for the decisions affecting the CO2 emissions of the ship (including choice of fuel, route, speed and choice of cargo) and that would be held accountable for covering the compliance costs paid by the shipping company. It is not yet clear whether such binding clause will be an express legal requirement or an implied term. This amendment seeks to acknowledge that the shipping company is not always responsible for purchasing the fuel or taking operational decisions that affect the CO2 emissions of the ship. Those responsibilities can be assumed by an entity other than the Shipping Company under a contractual arrangement. This way the polluter pays principle would be fully respected and it is hoped that the uptake of efficiency measures and cleaner fuels would be further encouraged. Another reason for this amendment is to address the challenge competent authorities often face when trying to trace down a commercial operator for companies based outside the EU because there is no international registry of commercial operators in shipping. This way the proposed approach ensures that the final responsibility of the commercial operator, by establishing a contractual requirement between the shipowner and commercial operator to pass on the costs;
- 'Operation of the ship' is now also expressly defined for the purposes of the contractual allocation clause (see above) and means "determining the cargo carried by, or the route and speed of, the ship";
- The scope of greenhouse gases that would have to be accounted for by shipping companies could widen from 2026 onwards to ensure alignment with the Paris Agreement targets. The draft report also calls for the Commission to assess and report to the EU Parliament by 31 December 2026 on the impact on the global climate of GHG emissions, other than CO2 and CH4, from ships arriving at, within or departing from ports under the jurisdiction of a Member State; and Establishment of an 'Ocean Fund' is recommended to fund R&D into maritime decarbonisation, cleaner fuels, short-sea shipping and cleaner ports. The draft report recommends that this should be established from revenues generated from the auctioning of allowances in respect of maritime transport activities under the EU ETS and from penalties raised through the proposed FuelEU Maritime regulation to improve the energy efficiency of ships and support investment aimed at facilitating the decarbonisation of maritime transport, including as regards short sea shipping and ports. It is also proposed that the Ocean Fund should allocate special support to ice-class ships which are treated as particularly hard to abate.

CONCLUSION

The draft report is the first step in a long process before the European Parliament adopts its position for the negotiations with the Council. The draft report is due to be considered on 10 February 2022 and further amendments are due to be submitted on 16 February 2022. A vote on the final amendments is likely to occur around June 2022. According to the European Community Shipowners Association, the text does not capture all of the industry and stakeholder points which have been fed through since the original draft was published on 14 July 2021 and it remains to be seen what will make the final text. What seems clear, however, is that despite resistance from parts of the maritime industry the Maritime ETS is here to stay.

Source: Watson Farley & Williams LLP

Inséré 30/05/22 DOSSIER Enlevé 30/06/22

A simpler way to treat aft peak tank ballast?

Techcross has developed a way to treat aft peak tank ballast water in your main vessel ballast water system without mixing - with a different flow system

Treating aft peak tank ballast water is a headache for tanker operators. Aft peak tanks are small tanks in the stern of the ship used to ensure the propeller is immersed, to dampen propeller vibration, and to cool the stern tube bearing, which carries the propeller shaft.

The water in them needs to be put through a ballast water system like any other ballast water on the ship, to make sure that any foreign organisms are killed before the water is discharged to the ocean.

Regulations state that the aft peak tank ballast water cannot be mixed with the main ballast water tanks. This is because of perceived risks that oil from cargo in an adjacent tank could leak through corroded tank walls into the main ballast water tanks. The aft peak tank is located in a 'gas safe zone' so there cannot be any possibility for it to contain oil.

This means that tanker operators have been forced to consider a separate ballast water system just for the aft peak tank.

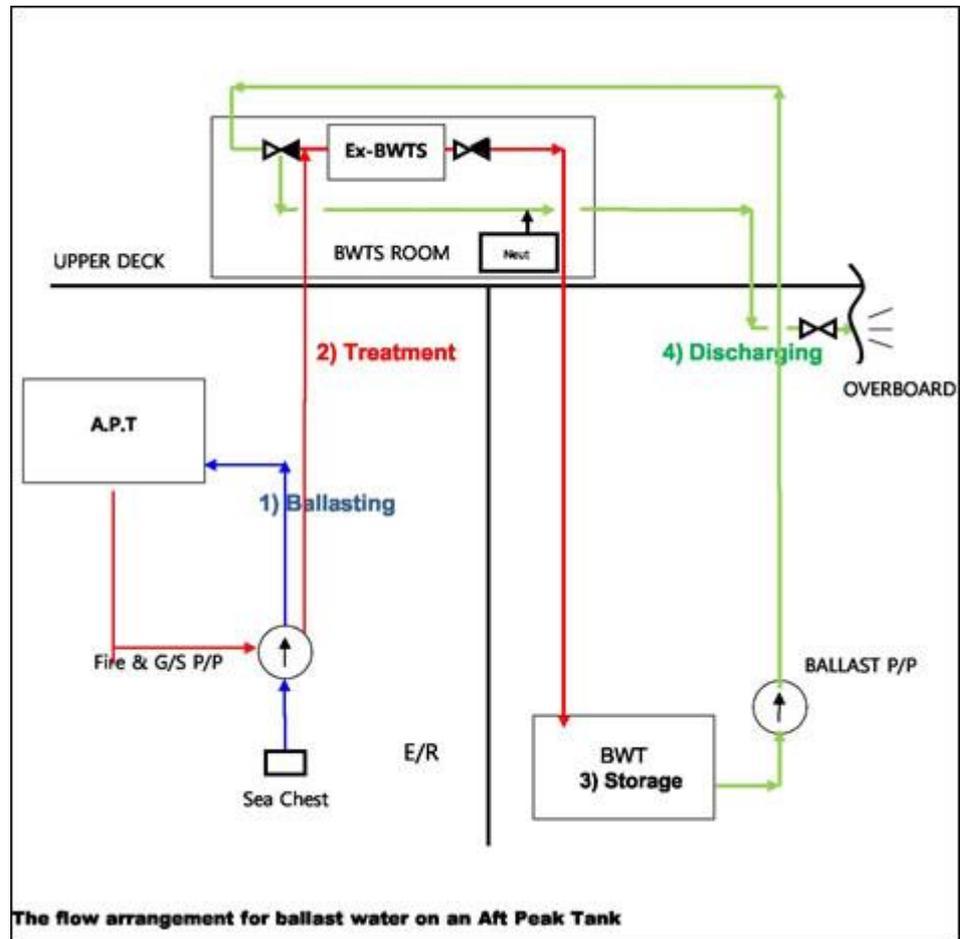
But Techcross, a ballast water system manufacturer in South Korea, has developed a different option, where the water from both aft peak tank and main ballast tanks could be handled by the same ballast water system, by structuring the flows in a clever way.

In Techcross' system, the ballast water system treats the water after it has been stored in the aft peak tank, but before it is loaded into the main ballast tank.

So during the ballast voyage, the water in the main ballast water tank is already treated, and afterwards it can be discharged to the ocean.

This process was approved by DNV in 2018.

In more detail, the steps are like this.
Step 1 - the Aft Peak Tank is filled with untreated water.
Step 2 - The ballast water in the Aft peak tank is transferred across the deck, in a 'non-return connection', to the ballast water treatment system, and then to an empty ballast water tank in the cargo area. The ballast water treatment system is in a hazardous area.
Step 3 - the water is held in the cargo ballast water area
Step 4 - the water is discharged using 'neutralisation'.
This is shown in the diagram.



Altogether, this arrangement can save customers the over \$100k cost of an aft peak tank system, the company says.

Since the Techcross system is electrochemical rather than ultraviolet, it does not need any filter, Techcross says.

Filters

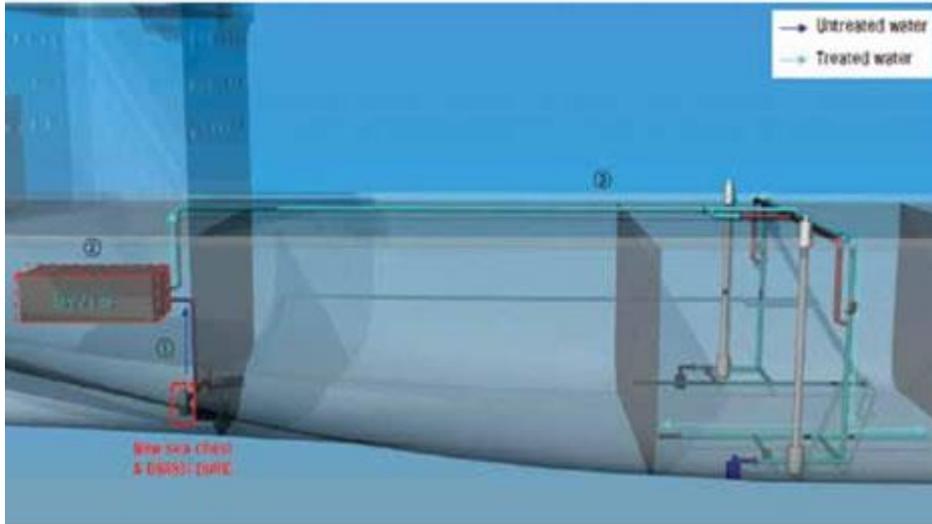
This layout would not work if a filter was needed because of other complexities.

In a normal ballast water installation, the water is both filtered and treated before entering the ballast water tank. This means that any organisms caught by the filter can be discharged into water in the same place they came from, as required under the regulations. However, it is not allowed to be discharged in a different location from where it originated. If you have a filter upstream of the aft peak tank (as it is filled with water), and a ballast water treatment system downstream of the aft peak tank after voyage (as the water is discharged), that is not considered equivalent to the type approved process, because organisms not separated by the filter can grow in size and volume during the voyage.

This would also make it harder for this water to be then flowed into the main ballast tank. But with the Techcross system, no filtering is needed, all the killing of the organisms is handled by the electrochemical process.

Submerged pumps

Techcross also has a system for tankers with submerged pumps, such as a Medium Range (MR) tanker, where there is no pump room.



The normal way to install ballast water systems on these vessels is in a specially designed room on deck.

This involves safety concerns and a high cost of installation. Being on deck, the systems need to be explosion proof, which increases the cost.

The Tech Cross system can be

Handling ballast water from a tanker with submerged pumps

installed in the engine room, which is not considered a 'hazardous' environment, so the system does not need to be explosion proof, and welding is much easier. This is possible because its systems are small.

The system has a modular design and small footprint.

This enables customers to save 20 per cent of the price of the system, and 30 per cent of the installation costs.

The submerged pumps are used only for de-ballasting. A different pump - a fire pump or general service pump - is used for loading the ballast tank.

This solution has been applied to over 50 newbuild medium range tankers at Korean shipyards, and a number of retrofits.

EPA's VIDA

The US Environmental Protection Agency (EPA) Vessel Incidental Discharge Act (VIDA) National Standards of Performance are new proposed ballast water regulations which could apply to small vessels (less than 79 feet in length) and fishing vessels of all sizes. Vessels above 79 feet are covered by existing legislation.

Techcross makes a very small ballast water system, ECS-150, which is supplied mounted on a skid, as a 'one size fits all' system for easy installation.

Techcross is currently researching ways to reduce the footprint and cost of this system.

About Techcross

Techcross supplies an electrochemical based ballast water system. It has 3762 systems installed in the maritime industry, as of July 2021.

It claims that its systems have a lower operating cost but the same performance as others in the market.

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An examination of the key benefits of assigning stable or fluid crews within the Merchant Shipping Industry

September 2019

Executive

summary

The Effective Crew Project showed that stable manning strategies can be cost effective and demonstrated clear benefits:

- for safety outcomes – with improved accountability and responsibility, leading to better vessel maintenance and familiarity with vessel and equipment;
- for the well-being and competency of the crew – with higher retention rates, a greater sense of ownership, familiarity, trust and loyalty, and increased capacity for on the job learning and mentoring;
- for longer term financial savings – with improved inspection results, reduced training and recruitment, and improved operational costs.

However, the research also identified various factors that influence the success of stable crewing, including:

- the effectiveness of the leadership and management skills on board or ashore – which need to be current and sensitive to continuous crew development and efficient vessel operations;
- the expansion or reduction in fleet size – which means crew stability can be difficult to maintain;
- the ability to accurately measure the financial implications of different crewing strategies – for precise evaluation of a crewing strategy.

Shipping is the instrument of globalisation and the international community depends upon safe, efficient, sustainable and reliable transportation of commodities and goods to promote social well-being and economic health. Where the industry fails in one or more of these respects it can have a profound impact on communities, the environment and the economy. Given the demands on the industry and the consequences of failure it is important to understand the factors impacting the performance of those employed at sea in order to permit the creation of an optimum working environment where negative outcomes are less likely.

The merchant shipping industry in common with others maintains a constant focus on its cost base. As crewing is the largest controllable part of a vessel's operating budget it often receives a great deal of scrutiny in terms of salaries and associated costs such as travel. This narrow focus on cost, if taken in isolation, risks missing the contribution of crewing strategies to other value-added aspects of vessel performance, however little research has been conducted in this respect.

The Effective Crew Research Project, sponsored by the Lloyds Register Foundation and the TK Foundation, was a two-year study which examined the benefits and challenges of implementing stable and fluid crews within the merchant shipping industry. The focus was on vessels types with more than 20 crew including: tankers, car carriers, containers, bulk carriers and chemical carriers, although some additional data was collected. The research incorporated a review of literature and collected data from an industry wide survey and 29 interviews with experienced maritime stakeholders and experts from other industries, including healthcare and aviation.

The research has shown that the fluid nature of crewing within the sea-going area of the industry negatively impacts on crew welfare, crew and vessel safety, and does not encourage employment retention. Stable crewing, however, is shown to develop a greater sense of ownership and responsibility which promotes better safety outcomes including improved vessel maintenance and knowledge of specific equipment on board.

Team familiarity generated by stable crewing was also found to promote trust and good working relations, which can increase productivity and provide better mental health outcomes for the crew. Other benefits from stable teams included improved vessel maintenance and reduced maintenance costs as well as shorter handover times and recruitment costs. These outcomes have longer term financial benefits for vessel operations and the shipping company. However, those implementing stable teams, particularly for the top 4 senior officers, should be aware that this can mean fewer promotional opportunities and, over time, an increased risk of complacency. Although there are some clear benefits to stable crewing, the uniqueness of individual shipping companies means that one size does not fit every situation. It is therefore vital that crewing strategies are continuously and consistently evaluated and adjusted where necessary. Changes to a different crewing strategy, or combination of strategies within a fleet, should be considered if evaluation highlights this as the best option for maximising cost efficiency, safety and crew well-being.

Regardless of the manning strategy adopted, it is important to recognise the influence that leadership and management can have on on-board culture. Poor leadership, despite the crewing strategy implemented, can have a detrimental effect on crew wellbeing and safety and ultimately on the budget. Recommendations from this project therefore include greater support for the senior officers both from shore side personnel, and on-going leadership training and development.

It is paramount for the ethical and sustainable advancement within shipping, that the highest levels of on-board team working are understood and achieved. This in turn will promote efficient, safe and sustainable working practices that support the best outcomes for the crew.

Crew management

As discussed above, crew familiarisation and therefore invested crew management, is key to safe ship operations. Powell (2015) noted that crew have a preference to work directly for the ship owner. Agency and manning only agreements, although frequently used, can distance the crew from this relationship. Powell defines a range of crewing options from owner employed and agency employed crew which include the following:

1. Owner employed and technically managed
2. Owned agency employed with owner sponsored benefits and bonuses and technically managed
3. Owner agency employed with owner sponsored benefits and bonuses and third party technically managed
4. Third party agency employed, combined with third party technical management with owner sponsored benefits and bonuses
5. Third party agency employed, combined with technical management
6. Third party agency employed with owner sponsored benefits and bonuses
7. Third party agency employed

Powell suggested that the further the distance from direct employment, the more potential there is for safety issues to occur.

Project definitions

Different definitions have been used to describe different crewing strategies. Following a review of published literature to determine the most common terms applied within the industry, this research uses the following definitions.

Stable crewing

The top four senior officers returning to the same vessel for more than one voyage.

Fluid Crewing

The top four senior officers and the rest of the crew randomly assigned to any appropriate vessel.

Manning pools

The top four senior officers rotating around a fleet of ships, usually of the same vessel type, where they are likely to be reassigned to the same vessel over time.

Crew composition and assignment are an essential component of the efficient running of a ship but can vary considerably. In the merchant shipping industry, there are companies operating stable crewing strategies where the same senior officers (top four) operate on a back to back basis and return to the same vessel for several trips, with all four joining and leaving the vessel at the same time. More usually, companies operate a fluid system where senior officers are assigned to any appropriate vessel and will sail with different senior officers every trip; the companies will generally avoid changing all four senior officers at the same time. In some cases, companies have opted for a hybrid approach where senior officers remained within a fleet of vessels, so that they regularly sail together but not necessarily on the same vessel. This is usually referred to as a 'manning pool' system.

Seafarer's employment

Seafaring employment varies considerably ranging from a stable environment where seafarers may return to the same shipping company and sometimes the same vessel, to those that are deployed onto different vessels and perhaps different vessel types, voyage after voyage (Walters and Bailey, 2013). The current employment norm for seafarers is one of a fluid nature and lacking in work-place specific familiarity. Leong (2012) suggests that this fluidity of employment means that the seafarer labour market is often considered to be of a homogeneous nature. The STCW contributes towards this position by enabling certified and trained seafarers to be employed at sea on any vessel type without the requirement to obtain further qualifications (Devereux, 2017). However, the ISM code provides familiarisation training to counter this issue, focusing on the actions to take in an emergency and the use of mandatory safety equipment.

Basic training is also required before commencing work on-board. Seafarers joining a ship for the first time are meant to receive vessel specific familiarisation to enable them to use the equipment on-board safely and become familiar with the vessel and operational standards. However, Devereux (2017) found that the practice of the ISM code and familiarisation guidance was not always followed on board, despite it often appearing to the shore office that the requirements had been met (Devereaux, 2017 and Bhattacharya, 2009). Often, there is little time for seafarers to have the required training as many will have to start work as soon as they join the ship. This can be compounded by the senior officers being particularly time pressured just before they leave port, making the familiarisation training, which generally occurs at a similar time, a lower priority.

Devereaux's research also highlights the point that despite SOLAS specifying mandatory equipment that needs to be held on board, the makes and models are not standardised. This means that even within the same fleet, there may be different versions of equipment, further emphasising the need for familiarisation of the vessel and its equipment before every voyage. Lack of workplace specific familiarity can therefore negatively impact on personal safety and the perception is that this is worse at the start of a voyage. The lack of specific vessel familiarity was thought to be an issue for all the crew, rather than just the individual concerned and something that could affect the operational safety of the vessel (Devereaux, 2017). However, it should be noted that shipping companies do not collect data concerning injured seafarers and their familiarisation with the vessel, despite

Hansen et al (2002) demonstrating that seafarers returning to the same (familiar) vessel are less likely to be injured.

Legislation and maritime safety

Shipping is governed and regulated by multiple organisations. The interaction between these and how they impact on vessel operation and management is complex, but the regulatory requirements dictate the way in which a vessel is operated and managed on a daily basis (Figure 1).

The International Maritime Organisation (IMO) is the UN Agency with responsibility for development of regulation relating to the safety of shipping and protection of the marine environmental impacts from shipping. These are commonly perceived as the 'regulators' for the industry. The four key pillars of international regulation for the maritime industry include MARPOL (International Convention for the Prevention of Pollution from Ships), SOLAS (International Convention for the Safety of Life at Sea), STCW (Standards of Training Certification and Watch-keeping) and MLC (Maritime Labour Convention, 2006) (ILO,2019). However, any proposed regulation that is drafted by the IMO has no legal standing until it has been embedded within the national law of the Flag state, where the ship is registered by the ship owner. Additionally, vessels must comply with Port State Control (PSC) requirements of any states' ports or waters they are operating in and with any additional regional regulation. There may also be further requirements that govern specific sectors such as OCIMF (Oil Companies International Marine Forum), International Oil Tanker and Terminal Safety Guide (ISGOTT) and International Marine Contractors Association (IMCA) that cover the oil, gas and offshore industries. Requirements concerning seaworthiness fall under the remit of the Classification Societies who issue class certification and conduct audits for both the class and on behalf of Flag states.

Failure to comply with regulations can have serious ramifications for the safety and well-being of those on board, and for the environment, and may potentially lead to significant financial losses if a vessel is taken off hire for mechanical breakdown or compliance failure or possibly detained in port. Regulatory compliance is therefore the cornerstone of the safe management and operation of a vessel, which is directly linked to the knowledge and technical competence of those on board (and ashore), particularly that of the senior officers. The research findings clearly demonstrate how the competence and technical knowledge of senior officers on board impact on the safe management and operation of a vessel and the relationship with regulatory compliance.

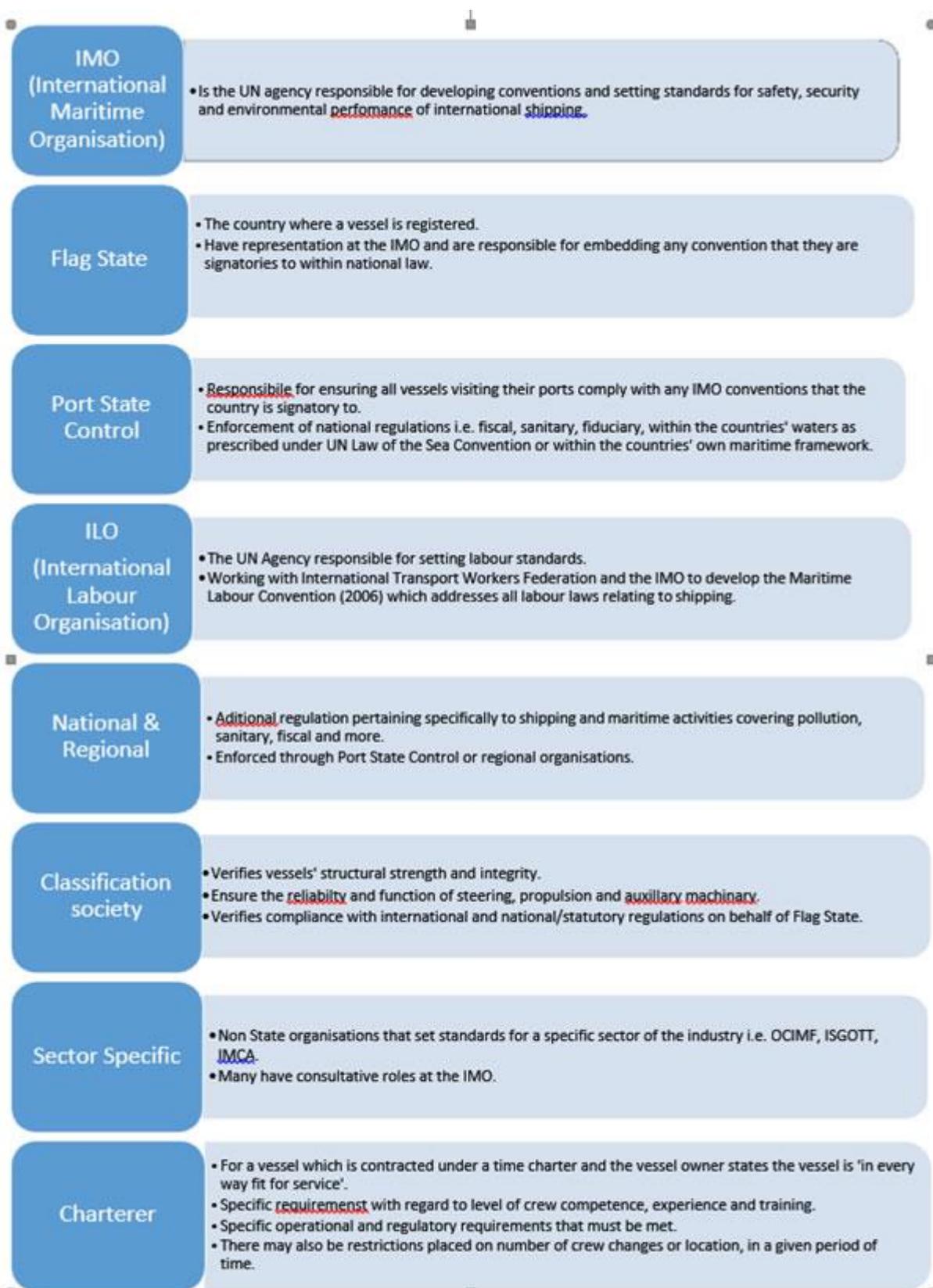


Figure 1: Regulatory overview impacting maritime safety

Crewing strategies and well-being

The research showed that seafarers' well-being is improved by crew stability within a team. Well-being as defined by the Oxford dictionary is "the state of being comfortable, healthy

and happy" (Oxford University Press, 2019). However, it should be recognised that well-being is a broad concept that should include a longer-term view of an individual's reality and satisfaction of life in total. Sense of purpose and the control that is felt in relation to being able to change circumstances is also a fundamental aspect of well-being (Mental Health Foundation, 2015). The New Economics Foundation (2012) has a more specific definition of well-being which states that "*Wellbeing can be understood as how people feel and how they function, both on a personal and social level, and how they evaluate their lives as a whole*" (New Economics Foundation, 2012). The Office for National Statistics (2019) offers 43 indicators to measure well-being, including:

- Personal well-being (EG. Happiness, and mental well-being amongst others).
- Relationships (includes, loneliness, unhappy relationships and people to rely on).
- Health (EG. Healthy life expectancy and depression or anxiety and others).
- What we do (EG. Job satisfaction, unemployment rate and satisfaction with leisure time and others).
- Where we live (EG. Feeling safe, access to natural environment, belonging to neighbourhood and others).
- Personal finance (EG. Difficulty managing financially and others).
- Education
- Governance
- Environment

Crew stability within the Merchant Navy has been recognised as a way to improve seafarers' psychological well-being and reduce symptoms of mental health (Andrei *et al.* 2018).

Finance

Financial viability

is essential for the successful operation of any shipping company. Many costs are associated with vessel operations including primary ones such as fuel, maintenance, logistics and crewing costs. As we move into the digital age, it is even more important to have accurate measures to justify expenditure, and crewing costs are an essential component of this.

As highlighted earlier in the report, crewing costs represent approximately 50% of the ship's operating budget. Overall operating costs are beginning to increase further after a period of recent stability in the industry (Drewry, 2018). Therefore, many shipping companies are experiencing a sustained period of financial pressure and this has been reflected within the research findings.

"With such a long period of a poor market in shipping across the sectors, cost focus becomes more and more important."

"Ship downtime = loss of earnings. All shipowners want to make a profit, it is not an altruistic form of employment."

Vessels are considered long-term assets, which generally influence decisions that are made about ship operations. Financial sustainability requires a broad understanding of all the elements that influence ship operations for longer term cost benefits, including the safety and well-being of the crew. A manager interviewee made the following response in the research survey that sums this up. *"...[It's] Not just wages and repat. figures, but the long-term effect on ship performance of a well-integrated team on board"*

In terms of crewing, the associated costs identified from the research, stem from a number of areas which are displayed on Figure 5.

Areas of cost impact



Figure 5: Areas of cost impact

Market conditions

Market conditions make up one of the external factors that influence the crewing strategy selected by a company. The stability or volatility of the market can dictate whether a company decides to invest in more ships and expand their fleet or to sell ships on or even send them for scrapping. If the market is stable and fleets are not being expanded or reduced, then it is easier to maintain a stable crew. A volatile market favours fluid crewing, allowing for the rapid recruitment of seafarers with no obligation to re-employ if they are not required. This short-term approach has implications in many areas, not least crew well-being, as people become dispensable in declining markets. Thus, market conditions, vessel supply and availability of seafarers (including the specific skills required) will have an impact on the crewing strategy a company selects.

Recruitment

Stable crewing and improved crew retention have the potential to reduce recruitment costs over time. Fewer crew changes mean lower costs in areas such as the number of actual repatriations, visa applications, ID checks or in recruitment (including advertising, interviews and induction for example). Stable crewing also leads to a greater commitment from senior officers to the vessel they work on. Conversely, financial benefits have also been associated with fluid crews which may include deploying cheaper resources to reduce crew costs. However, the research indicated that this practice has in some cases been undermining experience and skills within the industry, as noted in the quote below.

" a lot of the good experienced people have now been lost to the industry in favour of cheaper."

The data indicated that fluid crews would ultimately cost more in terms of management resources and vessel maintenance, due to the lack of stable employment of the top four senior officers.
"increased costs to maintain vessel, more management resource"

Charterer requirements

Charterers will hire ships from ship-owners for either a single voyage or for a given period. Within a time-charter agreement there may be very specific requirements in the way in which the vessel is manned. This could relate to experience, competence and training of the crew on board. There may also be specific restrictions with the number of crew changes, days available to undertake maintenance and costs associated with time 'off hire'. Additionally, in some sectors (most often oil, gas and offshore) the charterer may insist that the vessel owner ensures vessel compliance with additional sector specific requirements.

There was a sense that charterers needed to be accommodated as,
"..... they're the ones paying the bill and you need to keep them happy"

The charterer's decisions concerning the length and the type of charter, which is based around the best price for the vessel, was thought to have a strong influence over the general environment on board.

"The length and type of charter has a major bearing on the motivation on board and the money spent on board the vessel by the company chartering the ship."

Crew changes

The research respondents identified a range of criteria which can impact crew changes which included flexibility, logistics and crew travel. Crew changes refer to the frequency of crew joining or leaving a vessel at the start and end of a voyage; the regularity of which is determined by the crewing strategy that is in place. Although the regularity of crew changes may be influenced by the crewing strategy, the expected duration of voyages is set down within the contract of employment. This is usually a trip duration of between 3 and 6 months or 5 weeks on 5 weeks off.

Flexibility

Flexibility surrounding the scheduling of seafarers on board vessels, based on factors such as availability, rotational shift patterns, periods of leave and illness, was considered important by all respondents. Managers and ship owners assigned 5.8 out of 7 for this aspect and, unsurprisingly, recruiters assigned the highest value for flexibility at 6.3 out of 7.

Flexibility in relation to crew fluidity is key, as the quotes below demonstrate.

"Flexibility is extremely important; changes can occur at short notice & we need seafarers who are flexible [with] joining/leaving arrangements & this is partly reflected in the manning strategy."

"There should be flexibility but within limits as continuity and ability for cooperation should also be taken in account".

"Of-course this is important but there are also other factors [such] as costs and having enough seafarers [on] standby"

Crew travel costs

Crew travel costs are a relatively small part of the ship's total operating costs but are significant in terms of the organisation required and present potential visa issues, which are discussed in the next section. The quote below makes the point that it will cost the same to transport a cheaper officer as it would a more expensive one.

"... less important than the quality of the officer, travel costs are [a] small element compared to wages and total crew budget. It is no good recruiting cheap people. They are often no cheaper to recruit and move from A to B than high quality crew. In certain markets where charter and vessel day rates are critical this would not hold when owners are operating on marginal profits."

There was conflicting opinion on the issue of crew travel, with some people experiencing increased crew travel costs with stable crewing, and others experiencing reduced crew travel costs.

Where a vessel had an unpredictable trading pattern, crew changes may need to be made in remote and inconvenient locations and could lead to increased travel costs. Despite this, some companies attempted to continue with the planned crew change irrespective of the location of the vessel and made the arrangements centrally with little interaction with the officers concerned. In these cases, the crew travel costs tended to increase. Other companies involved the officers in the crew change discussions and even delegated the decision to the ship with the proviso that the overall crew travel budget was achieved. In these cases, the crew travel costs tended to reduce. This was another example of leadership and decision-making being a significant influence on the impact of whichever crewing strategy was adopted (Case-study 2).

Visas and nationality

The nationality of a seafarer often has a bearing on a company's decision about crewing. Companies commented on a range of issues linked to nationality that they tried to consider when selecting crewing strategies. These included ease of obtaining visas, maintaining a balance of nationalities onboard, avoiding certain combinations of nationalities, taking into account perceived national preferences about fixed periods of employment and return dates.

"East European officers are placed on vessels calling in Europe, whilst Asian seafarers are connected at most cost-effective port[s] within Asia"

Visa issues are complicated, with some companies paying for visas and associated expenses such as crew working in certain locations or for staff joining a vessel in a specific country. Other companies expect these costs to be covered by the seafarer. To facilitate seafarers travel, the ILO108 Seaman's Card (ILO, 2017) was intended to be an internationally recognised document that enabled seafarers to join and leave vessels with less stringent visa requirements. Unfortunately, the cards do not have global recognition and countries operate many versions of the system. Therefore, obtaining visas for certain nationalities to operate out of certain ports can be problematic. Issues arising can increase the time and cost of employing certain nationals.

Logistics

Logistics, within the scope of this research, refers to the planning of a seafarer's availability and the physical placing of a seafarer on a vessel; this may involve international travel.

Recruitment and travel requirements for hiring and deploying a seafarer to a vessel are also part of logistics' planning. Different companies adopt different strategies which are influenced by how the cost items are identified in their budgets and detailed in their reporting systems. It can be suggested that the more visible the logistics and travel costs

are, the more people feel the need to demonstrate that they have managed them effectively.

"We try to manage crew changes in key ports where we know costs can best be mitigated & fully reflected in manning procedures ashore."

"If there is the choice to deploy somebody whose place of residence implies less travel costs, we would prefer him/her, provided suitability for the Job."

"Money always has an impact, but we would reduce the number of nationalities/markets for sourcing and thereby compensate."

Flexibility surrounding the seafarer's ability to join and leave a vessel, providing more options in logistical planning, was highlighted as an important consideration in the recruitment process, which can be reflected in a crewing strategy. One respondent has noted that a fluid crew could

"allow for greater flexibility in the rostering of vessels and cost effectiveness in flights and agency costs"

Company loyalty

The research indicated that fluid crewing strategies do not foster company loyalty and often encourage seafarers that are looking for the highest remuneration over anything else. Additionally, some companies reported higher retention when they adopted stable crewing. *"Company loyalty is almost non-existent these days. Unfortunately, this now even seems to extend to the vessel and the other persons onboard. Many seafarers are only there to get paid, even if they do not admit it."*

"The seafarer will always desire the best remuneration he or she can obtain. This is the mercenary element."

Vessel maintenance

Maintenance of a vessel has financial implications which are impacted by different crewing strategies. Vessel maintenance refers to the overall upkeep of the vessel, including routine, non-routine and proactive upkeep. As crews develop stronger relationships and greater knowledge of the vessel and its equipment over time, the accountability, trust and performance amongst the team increases leading to greater responsibility for one another and the vessel.

"So that means that he knows how the equipment is working so he will be more confident when he has to take [a] decision, he knows how things operate, maintenance should be higher and then we hope we can generate a higher feeling of belonging every time he comes back to the same vessel."

"They handle their stuff with care because they are well aware that they have to return."

"Depends on the requirements of the Client to run either a vessel at minimum costs or to properly maintain the asset, i.e. for selling purposes."

"This is as important in managing the cost-effective operation of the vessel as any other factor. Poor maintenance costs, and it costs a lot compared to high quality crew and effective PMS [Planned Maintenance System]."

"Of course, vessel maintenance is of utmost importance operationally as it ensures a vessel is able to keep up to its ETAs and good efficiencies."

A stable, engaged and motivated crew will keep the vessel operating in the best condition. This not only prevents mechanical failures, but also maintains the vessel to legislative standards and removes potential problems from the inevitable port state control inspections.

A slightly different perspective was offered from a seafarer.

"Much of the pride in a ship comes from the top down and this includes shore management making funds available to carry out this work (time, tools and materials)."

Measurements and decision making

It became apparent (particularly from Case-study 2) that although many shipping companies have sophisticated measurement systems in place to monitor a wide range of performance areas, some of the relevant measures were not always included when making business decisions about which crewing strategy to adopt. In some cases, the decision to move to a new crewing strategy was based on only one main area of operation, for example, the technical performance of the vessel or the ease of being able to provide suitably qualified crew for the vessels (Case-study 2).

Use of key performance indicators (KPIs) and measurements

The use of KPIs and regular performance reviews, based on a range of pre-defined measurements was found to be widespread among the shipping companies contributing to the research. It was also common for the impact of the crewing strategy decision not to be formally reviewed against any agreed measurements to enable the business to assess the impact of the strategy selected.

One of the companies involved in the case studies shared two years of data comparing measurements for vessels that had changed from fluid to stable crewing. Analysis of the data identified several areas that appeared to have been impacted by the change in crewing strategy. When this was discussed with the company it transpired that there were several other factors that affected the vessel's performance which were not shown in the standard measurements used to review performance every month. This raised questions about the value of the large amounts of data being collected, analysed and presented in regular management meetings. It also highlighted the need for any measurement system to be carefully designed and reviewed to provide comparable and consistent data on which to base crewing strategy decision making (Case-study 2).

Summary of financial implications of stable and fluid crewing

The research identified financial implications associated with stable and fluid crewing. Crew stability promotes investment in people and sees it pay back over time in terms of reduction in recruitment costs, shorter hand-over times, and the greater sense of well-being and ownership that crew feel when valued. Fluid crewing offers increased flexibility around recruitment and provides access to wider labour markets with shorter term cost benefits for fleets in rapid expansion or decline. Various viewpoints were offered on some key cost areas, however, there was little evidence of a systematic, measurement-based, decision-making process being consistently applied.

Financial benefits

- Reduced maintenance costs.
- Improved compliance with Planned Maintenance System (PMS).
- Improved quality of maintenance.
- Reduced breakdowns and rework.
- Fewer port problems.
- Fewer cargo problems.

- Improved audit and inspection results.
- Reduced handover times.
- Greater knowledge of the vessel and equipment leading to improved performance and faster problem solving when problems occur.
- Increased sense of ownership and accountability from senior officers.
- Improved communication between the ship and the office.

"So, we know that our stable crew is slightly more expensive .. but we know on the other side that in costs including shipyard periods, in water survey periods and normal spare part procedures and [the] like, that we are less expensive than outsourced vessels. And on the other side, on the safety side, we know we have less accidents on our vessels." (Interview 14)

Financial challenges

The research identified certain, predominantly financially driven circumstances where stable crewing can be less attractive to shipping companies. These include:

- rapid changes in the size or make-up of the fleet, resulting in the need to employ new crew or move crew to vessels in which they had relevant competence.
- the need to rapidly introduce new vessels or new technology.
- specific charterer requirements, particularly concerning the need to comply with various matrices; this can create the need for crew to be allocated to specific vessels to fulfil the specification of certain matrix requirements, even if that means disturbing an existing team.
- the lack of good leadership and team building skills amongst the top four senior officers.

Other challenges with stable crewing include:

- Reduced flexibility for deployment of crew.
- Issues with travel and visas for some nationalities.
- Complacency amongst crew if a team is kept together for too long.

Due to the distinctive nature of each shipping company it is not helpful to offer a standard solution for an optimum crewing strategy. Rather, there are many different solutions that can be adopted depending on the individual circumstances of the company, such as the company size, growth projections, geography (in view of applicable legislation and proximity to supply of seafarers for example), age of the fleet and vessel types. These factors are primary when considering the best crewing strategy to implement and the financial bottom line affecting the company.

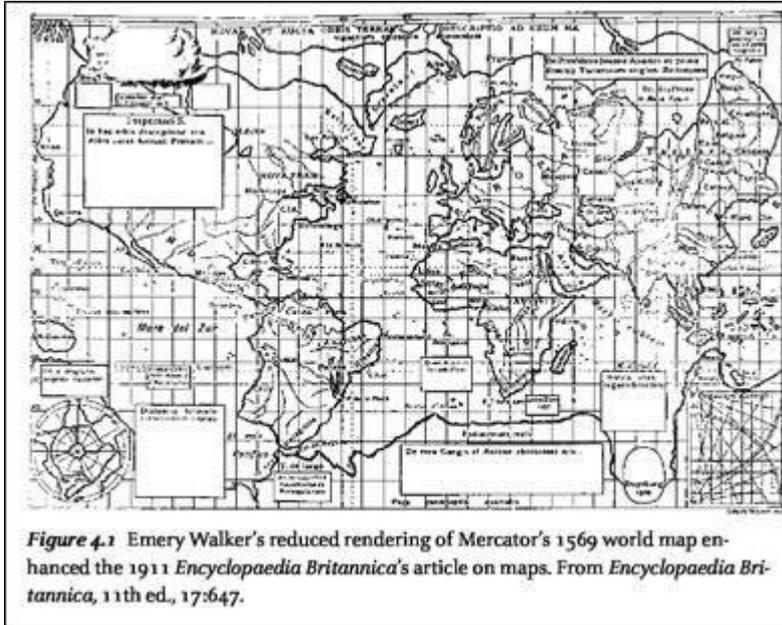
Inséré 02/06/22 HISTORIEK HISTORIQUE Enlevé 02/07/22

Mercator- Bearing straight (IIIa)

Revealing Replicas

Few historic maps demonstrate as dramatically as Gerard Mercator's 1569 world map that size is both an asset and a liability. Printed on eighteen separate sheets and measuring 80

by 49 inches (202 by 124 cm) when fully assembled, its abundant space easily accommodates the detailed coasts and continents that proved a valuable source for smaller, less detailed world maps by Ortelius and Hondius, among others. Its suitability as a wall display, vulnerable to light and dirty fingers, partly explains the small number of surviving copies—a mere four complete sets if you include one lost in World War II—as well as its rare appearance as a facsimile illustration in books about old maps and cartographic history. When reduced to a black-and-white page-size halftone with noticeable lineations where its sheets meet, the famous chart becomes a disappointingly drab demonstration of its illustrious author's skill as a cartographer.



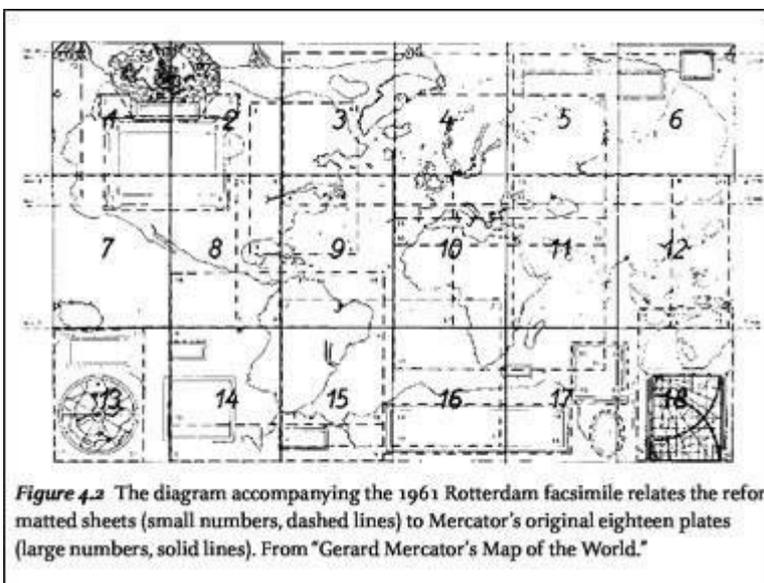
Several illustrators devised clean, book-friendly replicas by transcribing the map's key elements at a smaller, more manageable scale and adding labels describing its larger blocks of text. The resulting map of a map (so to speak) not only affords a concise graphic summary of its prototype's geography but also allows for further reduction, as in figure 4.1, which reproduces at a still smaller size the version drafted by famed British engraver Emery Walker for the eleventh edition of *Encyclopaedia Britannica*,

published in 1911. The warped frame of the Britannica image, which measures 7 inches wide, suggests it might have been picked up photographically from an earlier illustration, perhaps in another publication. Despite this flaw, Walker's diagram captures the essence of Mercator's grid, layout, continents, and obvious belief in a southern continent (Antarctica) and northeast and northwest passages across the Arctic. Similar renderings with English translations of legend labels illustrated a 1969 science article commemorating the great map's four hundredth anniversary and a 1947 guidebook on map projection (*The Round Earth on Flat Paper*) from the National Geographic Society. Although these small quasi facsimiles lack the authenticity of Mercator's intricate engraving, they illustrate nicely the progressive poleward separation of his projected parallels.

Full-size, eighteen-sheet facsimiles afford a more realistic impression of the famous mapmaker's attention to detail. The oldest is part of *Les monuments de la géographie*, a collection of twenty-one facsimile maps published between 1842 and 1862 by Edmé-François Jomard (1777–1862), a Parisian geographer who had served with Napoleon's 1798 Egyptian expedition. In 1828 Jomard founded what eventually became the Bibliothèque Nationale's Department of Maps and Plans, which owns one of the surviving copies. The municipal library in Breslau (now the Polish city of Wrocław) furnished the originals for the Berlin Geographical Society's 1891 *Drei Karten von Gerhard Mercator*, which includes the 1569 world map as well as Mercator's 1554 fifteen-sheet map of Europe and his 1564 eight-sheet map of the British Isles. Destroyed during World War II, the Breslau copy also served as the prototype for a commemorative edition published in 1931 by the International Hydrographic Bureau, headquartered in Monaco. The third known copy, in the Maritime Museum at Rotterdam, was reproduced in 1961 (a year before Mercator's 450th birthday) and distributed as a supplement to *Imago Mundi*, the principal scholarly journal for historians of cartography. A fourth copy, at the University Library of Basel, Switzerland, appeared in *Imago Mundi* in 1955 as a much-reduced 20 by 13 inch (51 by 33 cm) foldout.

Life-sized reproductions of Mercator's 1569 world map are not widely available in libraries and map collections. A joint search of the RLIN (Research Libraries Information Network) online catalogue and the OCLC (Online Computer Library Center) FirstSearch database, which focus on university libraries in the United States, failed to turn up a single copy of either the Jomard facsimile or its 1931 Monaco counterpart, although the National Union Catalog, printed in the late 1960s, found ten of the former but none of the latter. Many American libraries apparently did not bother to add older materials to their electronic catalogues. By contrast, my Web search uncovered twelve copies of the Berlin Geographical Society's 1891 version in American libraries—one more than the printed bibliography. Oddly, the Library of Congress (which apparently does not share all its holdings with RLIN or OCLC) owns both the Jomard and the Monaco editions but lacks the 1891 Berlin reprint. The 1961 Rotterdam facsimile fares much better: the Library of Congress has one, the National Union Catalog found nineteen more, and an RLIN/OCLC search uncovered another sixty copies in North American and Europe. The list would no doubt be longer had Imago Mundi automatically sent its Rotterdam "supplement" to all subscribers. Syracuse University, where I teach, has a run of Imago Mundi that starts with volume 1 (1935), but lacks a full-size facsimile of Mercator's 1569 world map. Yet the SUNY College at Cortland, forty miles south, has a copy, which I now know of thanks to FirstSearch.

If you think all "full-size" facsimiles look alike, think again. Although Gerard Mercator engraved eighteen separate plates and printed his 1569 world map on eighteen separate sheets of paper, the 1961 Rotterdam reprint consists of a large, atlas-like portfolio with fourteen huge pages that reformat the planet into geographically coherent chunks. A complex diagram (fig. 4.2) in the accompanying sixty-nine-page guide describes the scheme. The solid lines and large, bold numbers, 1 through 18, represent Mercator's original layout.



The dashed lines represent the reformatted "sheets," also numbered 1 through 18. Some of the new sheets are smaller than others and share a page in the facsimile atlas with another sheet. Note too that Mercator's original plates were in portrait format (longer vertical axis), whereas the facsimile is in landscape format.

If this reformatting seems needlessly confusing, consider the inconvenient boundaries between Mercator's original plates. Anyone familiar with U.S. Geological Survey topographic maps knows the problem of quadrangle boundaries that invariably partition our area of interest, however small, among two, three, and sometime four map sheets. Mercator's 6 by 3 grid validates this cartographic variant of Murphy's Law with horizontal plate boundaries that separate England from Scotland and chop off the southern tip of Africa while vertical boundaries slice through east Africa and what is now the eastern United States. Instead of retaining Mercator's original layout—a benefit only if you're obsessed with authenticity or eager to decorate a wall—a benevolent editor chose to preserve the integrity of continents and other large regions. Thus a historian interested in medieval Europe need only examine facsimile sheet 10, reformatted from plates 4, 5, 10, and 11 to include all of Europe (including Scandinavia) and the entire Mediterranean coastline. Similarly, an Africanist can concentrate on sheet 11, reformatted from plates 10, 11, 16, and 17 to include all of Africa and the Arabian Peninsula. This useful redundancy excuses the omission of tiny portions of Antarctica and northern North America, where equivalent

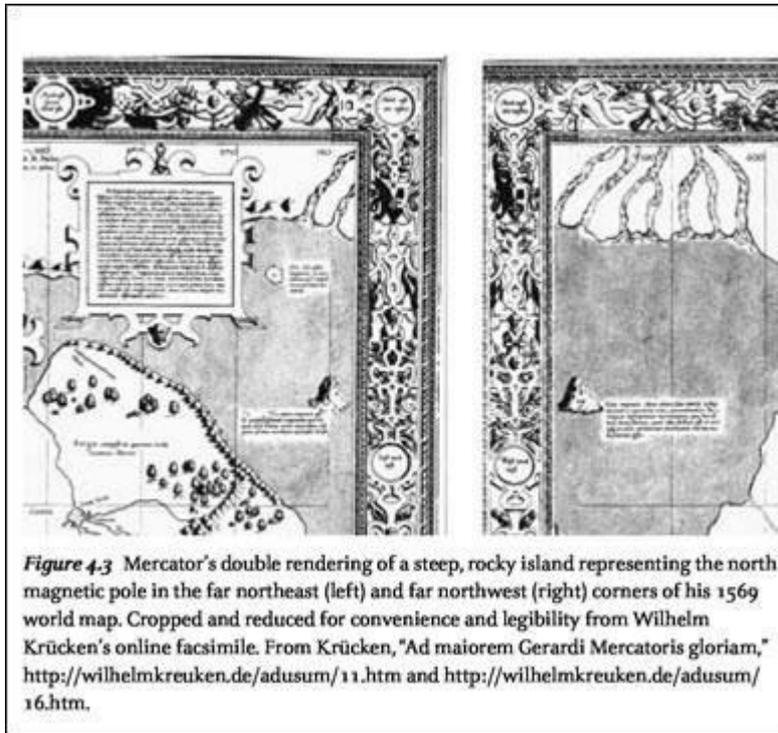
details are missing or inconsequential, as well as the museum's admission that "the size of the maps in the reproduction is slightly reduced."

If you think it unseemly for anyone to muck around with the great mapmaker's original layout, you'll not be surprised that the meddlesome editor of the Rotterdam copy was none other than Gerard Mercator, who willingly sacrificed three prints of some plates in reformatting his huge wall map into an atlas of coherent pages, not arbitrary quadrangles. To provide a meaningful geographic scope for each sheet, Mercator cut out appropriate portions of prints covering the region in question and mounted them on large, folio-size sheets of paper. Although the guide ignores the composition and condition of Mercator's adhesive, lines between adjoining pieces are readily apparent in the 1961 reprint. Repackaged as a portfolio atlas, the Rotterdam copy is notably different from its intact, eighteen-plate cousins in Basel and Paris, and the Maritime Museum owns the only copy so arranged.

A handwritten letter from Mercator found with the atlas indicates he assembled it around 1578 at the request of Werner von Gymnich, a wealthy patron. Sometime later a von Gymnich married a von Mirbach, and the atlas moved to the Mirbach estate at Harff Castle, near Cologne, where it evaded the public gaze until the late nineteenth century. Discovered in the course of an inventory of the Mirbach family library, the atlas was exhibited briefly in 1894, written up in a Frankfurt newspaper in 1902, and mentioned in academic articles in 1911 and 1930. Pieced together from printed map sheets, it earned recognition in Leo Bagrow's seminal *History of Cartography* as "the first printed sea-atlas."

Priceless objects become disposable assets during hard times. In 1932, amid the economic and political turmoil that eased the Nazi rise to power, the atlas appeared in the catalog of an auction house in Lucerne and caught the attention of the Maritime Museum's director, J. W. van Nouhuys. Eager to acquire a rare work of immense importance to cartography and navigation, van Nouhuys decided to attend the sale. On the way he stopped at Basel to examine the copy in the university library. His hopes rose when an overly optimistic auctioneer opened the bidding at 6,000 Swiss francs (3,000 guilders), raised the price twice, and failed to find a buyer. Convinced he had a chance, van Nouhuys returned home, found two wealthy contributors each willing to match the museum's 1,000 guilders, and mailed in the winning bid. The museum got its atlas. On at least one other occasion Mercator repackaged a wall map as an atlas. The evidence is a bound collation of regionally reconfigured cutouts from his maps of Europe (1554) and the British Isles (1564) as well as portions of the 1569 world map and thirty additional sheets from his friend Abraham Ortelius's 1570 world atlas. Dutch schoolmaster Thomas Varekamp, who discovered it serendipitously in a Belgian used-book shop in 1967, reckons that Mercator assembled the atlas in 1571 for his patron Werner von Gymnich, who undertook a lengthy tour of Europe the following year. As with the Rotterdam sea atlas, Mercator willingly cannibalized his wall maps to get the right framing. The nine sheets he assembled by cutting up four copies of his European wall map are especially rare because the last known intact copy was destroyed in 1945, during the siege of Breslau, along with the municipal library's copy of the 1569 world map. A pair of manuscript maps of northern Italy—the only surviving examples of maps hand-labeled by Mercator—makes the atlas triply unique. Robert Karrow, who considers it "the most important Mercator discovery of the twentieth century," once lamented the atlas's purchase in 1979 by the British Rail Pension Fund, which persistently refused scholars' requests for close inspection. But not any longer: a 1997 grant from the Heritage Lottery Fund enabled the British Library to purchase what is now known as Mercator's Atlas of Europe and endorse a facsimile reprint, which appeared a year later.

If you want your own copy of the 1569 world map and are willing to settle for less than full size, Respree.com, a Los Angeles dealer in posters and reproductions, advertises two poster versions at its Web site, one 24 by 31 inches and the other 37 by 54 inches. Reproduced in colour from an unidentified original, Respree's posters make attractive wall decorations but lack the detail of Mercator's lines and labels, better captured by a full-size black-and-white facsimile.



If you crave fine details, don't mind low-resolution scanned images, and can appreciate a well-illustrated online celebration of Mercator's projection, all in German, check out the "Ad Usum Navigantium" page of Wilhelm Krücken's Web site, "Ad maiorem Gerardi Mercatoris gloriam" (www.wilhelmkruecken.de). In addition to an incisive exploration of the projection's mathematical properties, Krücken provides individual screen-size images of all eighteen plates. Although the map's Latin inscriptions are barely discernible, its geography and artistry are

clearly apparent. Anyone with a high-speed Internet connection can move from plate to plate more readily than a library patron handling (carefully, I hope) eighteen oversize map sheets. It was during a cursory interactive examination of Krücken's facsimile that I first understood the great mapmaker's appreciation of modest amounts of redundancy. Unlike contemporary cartographers who give you the whole world only once, Mercator cleverly extended his left-hand plates a few degrees west of his 180th meridian and his right-hand plates a few degrees east to provide dual, alternative images (fig. 4.3) of what he considered the most likely position of the north magnetic pole.

For scholars concerned with a map's lines and labels, an accessible black-and-white facsimile is often more valuable than a rare hand-coloured print ensconced in a distant library. That's clearly the view of Swedish scientist-explorer Adolf Erik Nordenskiöld (1832–1901), who inspired map historians with his *Facsimile Atlas to the Early History of Cartography*, published in 1889 and reprinted in paperback in 1973. Unable to include Mercator's 1569 world map because of its huge size, he reported an analysis of its progressively spaced parallels. One column of a table contains distances from the equator calculated for a spherical earth according to the mathematical formula for the Mercator projection, and a second column lists the corresponding distances as measured on the Jomard reprint. The two columns are nearly identical up through 200, but a discrepancy apparent at 300 grows progressively larger with increased latitude. In attributing this discrepancy to "the imperfection of the mathematical resources of the map-constructors in the middle of the 16th century," Nordenskiöld suggests that Mercator employed a mathematical approximation that should yield a closer correspondence between the calculated and measured distances. Remaining differences, he argues, "can be explained by engraving-errors or by stretching's in the paper"—a persistent source of uncertainty when working with facsimiles of old maps.

Paper shrinkage is less troublesome in exploring Mercator's reliance on other mapmakers. In announcing the 1931 Monaco reprint by the International Hydrographic Bureau, Britain's *Geographical Journal* noted several dubious debts to Ptolemy, including a Niger River that connects with the Nile. Bert van 't Hoff, who prepared the guide accompanying the 1961 Rotterdam facsimile, listed other prominent influences, which are equally apparent on original copies and reprints. Especially noteworthy is Abraham Ortelius's 1564 world map, on which inscriptions nearly identical to their counterparts on Mercator's 1569 world map suggest that Mercator and Ortelius exchanged information or consulted the same sources. Impressed with an original print of the Ortelius map in the library at Basel, van 't Hoff

observed that "this beautiful and remarkable map deserves to be reproduced [and] also compared in detail with Mercator's map." He also recommended looking at Diego Gutierrez's 1562 map of South America (fig. 4.4, left), the likely source of Mercator's erroneous westward diversion of the coastline for what is now southern Chile (see fig. 4.1).

The straighter, more accurate rendering of the Pacific shoreline on Mercator's 1538 world map (fig. 4.4, right) confirms the adage that new is not always better.

One map certain to warrant a facsimile reprint—if it's ever found—is a larger version of Erhard Etzlaub's small maps of Europe and North Africa on what looks like a Mercator projection (see fig. 1.7). As I noted in chapter 1, two tiny maps produced in Nuremberg in 1511 and 1513 exhibit progressively spaced parallels, which suggest a deliberate attempt to straighten out rhumb lines. Facsimiles of these maps, each engraved on the cover of a portable sundial, have made map historians wonder what Etzlaub was up to and whether his tiny maps had influenced Mercator. In 1918, in a short note titled "Who Originated Mercator's Projection?" the *Geographical Journal* reported the opposing views of two German professors, Drecker and Hammer. Convinced that Etzlaub's maps were not flukes, Drecker believed the Nuremberg instrument maker had merely reproduced miniature versions of a much larger map, yet to be discovered. Hammer, who questioned Etzlaub's understanding of principles underlying the Mercator projection, wondered why no sixteenth-century geographer or mathematician had ever discussed his alleged innovation. Curious about current views among European map historians, I put the question of Etzlaub's influence on Mercator to Ingrid Kretschmer, who teaches the history of cartography at the University of Vienna. She began by noting that the University of Duisburg—the duke's idea was eventually fulfilled—celebrated the four hundredth anniversary of the great mapmaker's death in 1594 with three symposia, in 1992, 1993, and 1994. The series stimulated an intense reanimation of the Mercator's work, including a careful comparison of his and Etzlaub's maps by mathematician Wilhelm Krücken, who maintains the Mercator Web site mentioned earlier. According to Kretschmer, a detailed examination of graticules convinced Krücken that the two cartographers had applied different principles. Renewed interest in Etzlaub's influence failed to uncover a larger version of his tiny sundial maps—the several, larger scale road maps he published are all laid out on an equirectangular grid. More telling is Etzlaub's apparent failure to tout his accomplishment in a published article or private correspondence. In Kretschmer's opinion, it is "rather unlikely that a famous instrument maker and cartographer like Erhard Etzlaub would not have mentioned [his development of] a new projection."

Although Etzlaub's influence on Mercator remains a mystery, the great mapmaker might well have been inspired by the work of Pedro Nuñez (1502–78), a Portuguese astronomer and mathematician who described loxodromic spirals in 1537. In pointing out that a direct course is usually not the most easily followed course, Nuñez criticized globe makers for confusing great circles (orthodromes), which are easily delineated on a globe by a taut thread, with rhumb lines (loxodromes). Unless aligned with a meridian or parallel, a rhumb line is a comparatively complex corkscrew curve.

Mercator knew about loxodromic spirals as early as 1541, when he included a multitude of these curved lines of constant direction on his famous terrestrial globe (fig. 4.5). How he did this invites speculation: Mercator never described his method, and scholars have yet to uncover an earlier prototype. Dutch map historian Johannes Keuning concluded that Mercator simply drew his loxodromes graphically, "with the aid of metallic loxodromic triangles, made by himself." Using thin metal triangles or templates crafted to ensure constant bearings seems both obvious and ingenious. I'm surprised that Keuning, after proposing a graphic, ad hoc solution for placing loxodromes on a globe, did not dispute Nordenskiöld's assumption that Mercator used a mathematical approximation in laying out his 1569 world map.

Although mathematics provides a theoretical foundation for map projection, not all solutions are numerical. It's easy to see how a map-maker sufficiently clever to delineate curved loxodromes on globe gores could have straightened them out graphically on a flat map. Quite simple, in fact, according to Robert Karrow, who summarizes a likely Mercator

recipe in a single sentence: "By following his curved rhumb lines and noting the longitude at which these lines crossed the various parallels, then transferring these coordinates to flat paper using straight rhumb lines with the same bearing, he would have obtained the basic framework of his projection." As William Warntz and Peter Wolff point out in *Breakthroughs in Geography*, Mercator's genius lay in believing a solution existed. It might well have happened, they note, "that the requirement that rhumb lines should be straight lines could not be satisfied on any chart or map."

If copying is a clue, other mapmakers appreciated Mercator's genius less readily than his scholarship. Although no one adopted his projection for nearly three decades, his 1569 world map was a key source for his friend Abraham Ortelius's influential *Theatrum Orbis terrarum*, published in 1570. According to map historian Peter Meurer, Ortelius based eight of his plates on Mercator's map. A few writers have interpreted these similarities as blatant plagiarism, but most note that Mercator and Ortelius exchanged information and consulted similar sources. Ortelius was not the only mapmaker to rely on Mercator's geography. Features and place names from the 1569 wall map (but not its projection) are readily apparent on the world map accompanying the *Polyglot Bible*, published in Antwerp by Benito Arias Montanus in 1572, and the "Planisphere," a world map published in Antwerp and Amsterdam by Petrus Plancius (1552–1622) in 1592. Mercator's 1569 world map proved a convenient source for his son and grandsons, who compiled continental maps for the posthumous 1595 edition of his famous *Atlas*, which also includes a world map his son Rumold had published separately in 1587. Laid out on a pair of hemispherical projections, Rumold's map is a smaller-scale generalization of his father's much larger 1569 chart. Paradoxically, not a single map in the epic 1595 *Atlas* is on a Mercator projection.

Another paradox is the full-size 1574 woodcut reprint of the 1569 world map by Bernard van den Putte, an Antwerp engraver. With the apparent approval of Mercator, van den Putte reengraved all eighteen plates by cutting out non-inked areas on blocks of wood analogous to massive rubber stamps. Although coastlines and other features left standing on a woodblock are less elegant than lines cut into a copper plate, a wood engraver could add place names or descriptive text by merely cutting a rectangle into the wood and inserting pieces of metal type. That only a single sheet survives suggests that van den Putte's version was less commercially successful than Mercator's copperplate edition. Even so, this mechanical facsimile, which acknowledged Mercator's authorship, contributed to the projection's growing prominence and could have inspired one or more of three substantially smaller Mercator maps published around 1595. Nordenskiöld included one of them in his *Facsimile Atlas*: a 9 by 12 inch (22 by 32 cm) copperplate engraving from Matthew Quad's *Geographic Handbook*, published in Cologne between 1594 and 1608. Although Quad's map (fig. 4.6) lacks a graticule, its origin is plainly apparent in both its title ("... ad imitationem universalis Gerhardi Mercatoris") and the telltale shapes of its continents.

If multiple maps by diverse authors are a reliable indicator, Mercator's projection became the cartographic expression of a hot idea in the late 1590s, when Jodocus Hondius and Edward Wright offered their own versions of Mercator's world. Hondius's map predates Wright's, but as the next chapter points out, the Dutch cartographer relied heavily on the English mathematician, who developed a mathematical description as well as tables showing how to position the parallels. Although Mercator demonstrated the projection's look and use, Wright made the secret of its construction readily available to other mapmakers.

Mercator- Bearin

To be followed next week

Inséré 03/06/22 NIEUWS NOUVELLES Enlevé 03/07/22

Seaworthiness: An Important Lesson for Carriers

The obligation of seaworthiness is fundamental to contracts of carriage of goods by sea, but how far does that obligation reach? The award-winning shipping and maritime lawyers at Bahamas law firm ParrisWhittaker are highly experienced in advising and representing clients involved in shipping disputes. Shipowners should note the extent of their contractual obligations in respect of cargo, following an important ruling¹ from the UK's Supreme Court. The ruling has important persuasive authority on the courts in The Bahamas.

What's the background?

Following a series of navigation failures, a large shipping container CMA CGM LIBRA ran aground shortly after it left Xiamen for Hong Kong. The problems with navigation arose during a manoeuvre which took the master of the ship outside the buoyed fairway running from the port.

The passage plan being followed was defective as it had not provided warnings about the existence of depths less than charted outside the fairway. Fundamental to all contracts of carriage of goods by sea is the obligation of seaworthiness.

In this case, the cargo owners brought a claim against the ship owners. A key issue was whether the defective passage plan rendered the vessel unseaworthy.

The ship owners argued that it was not unseaworthy and (or alternatively) due diligence had been exercised to make the vessel seaworthy. They also contended that any negligence in passage planning was a navigational fault which is exempted as a 'nautical fault' under the Hague Rules (Article IV rule 2(a)).

The Supreme Court upheld the decisions of the lower courts and rejected the ship owners' arguments. It said that if the vessel is unseaworthy, it can make no difference whether negligent navigation is the cause of (or is itself) unseaworthiness – what matters is the fact of unseaworthiness.

The court also ruled that on a proper interpretation, the 'nautical fault' exception cannot be relied on here. The fact that the defective passage plan involves 'neglect or default' in 'the navigation of the ship' within this exception is no defence to a claim for loss or damage caused by unseaworthiness.

As for due diligence, the carrier can be liable if the defect or danger would be reasonably discoverable where due diligence is exercised once the vessel or cargo comes within its control. On this basis, the shipowners were liable for the failure to exercise due diligence in the preparation of the passage plan for the voyage, whether or not it had proper systems for passage planning and crew competence.

What does this mean?

Once the owners have assumed responsibility for the cargo as carriers, this ruling shows they are responsible for all acts of the master and crew done in preparation for, and on commencement of the voyage under Article IV. Ship owners must ensure that charts and defective passage plans are corrected and updated once they assume responsibility as carriers, or run the risk the vessel is unseaworthy.

Source: ParrisWhittaker – Jacy Whittaker and A. Kenra Parris-Whittaker

Inséré 04/06/22 NIEUWS NOUVELLES Enlevé 04/07/22

Women at sea: a great value for Furetank

A balanced share of women and men in crews is an important factor for everyone's well-being on board. Furetank has actively strived to attract skilled female sailors for many years: an effort which has paid off in many respects. For a shipping company, Furetank has a fair share of female crew members. Twelve officers including four senior officers, as well as three ratings, are women. According to Furetank's CEO Lars Höglund, this benefits the welfare of the entire company.

– We all want women on board, it brings a more pleasant atmosphere on the vessels. As in all industries, a diversified workplace in terms of gender and cultural background is a good thing. It helps us all grow as people and colleagues. If we are all similar we can only move in a singular direction. We want to shape a workplace with many perspectives represented, a round ball which can roll different ways and find new paths forward, says Lars Höglund.

Lars Höglund has been interviewed in a podcast (interview starting 21 mins in) by the Swedish Maritime Administration. The authority has observed Furetank's efforts to make women and men equally comfortable at sea and thereby attract more women to a traditionally mostly-male profession.

The administration representatives were guided around the engine room of one of Furetank's new vessels by Ailene Barrios, a Philippine crew member who joined the company as a student in 2008. She advanced all the way to her recent role as First Engineer. What they heard from the female crew members was basically that they were treated just like anybody on board, in an inclusive and welcoming working environment.

"I think a conservative view of shipping is that it takes muscles and strength to do the job. But today, working on board is mostly about technology and IT. The most important thing is that you are interested and committed to your work, no matter who you are. It makes us very proud to be perceived as welcoming towards women," says Lars Höglund.

Furetank's recruitment processes are entirely competence-based without quotas, but gladly, the move towards balanced crews is self-reinforcing. When female employees testify that Furetank is a good place to work, even more women apply.

Also, Furetank has consciously worked on facilitating family life, giving both mums and dads the possibility to take parental leave in a way that suits their families.

"We try to be as flexible as we possibly can. It benefits both our employees and the company. The more we can make them enjoy working with us, the longer they stay. Keeping our staff also means economic advantages so I see a great win-win," says Lars Höglund.

Inséré 06/06/21 BOEKEN LIVRES BOOKS Enlevé 06/07/22

Legal Handbook shipmaster 2nd edition.

Namens de **Nederlandse Vereniging van Kapiteins ter Koopvaardij (NVKK)** heb ik de eer om u het Legal Handbook Shipmaster aan te bieden. Dit Handbook is een initiatief van de **NVKK** en is digitaal verkrijgbaar voor iedereen die geïnteresseerd is in dit onderwerp zoals uiteraard de kapitein, maar ook de bemanning, reder, maritieme opleidingen en de overheid. Dit geldt dus voor iedereen op de gehele wereld.

Het Handbook is gratis te downloaden van de website van de NVKK (www.nvkk.nl) indien u meerdere exemplaren wil hebben voor uw medewerkers of anderszins. **Wij wensen u veel leesplezier met dit mooie Handbook. Kapitein Leen van den Ende - Voorzitter Nederlandse Vereniging Kapiteins ter Koopvaardij**

Inséré 06/06/22 DOSSIER Enlevé 06/07/22

Sanctions and STS Transfers – legal risks



In recent months, sanctioned countries such as Iran and Venezuela have reportedly increased their exports of oil, and cargo trackers have noticed increased ship-to-ship (STS) transfers at sea, most commonly off Malaysia, Africa and in the Caribbean.

Vessels involved in STS transfers thus risk unwittingly facilitating unlawful exports and legal repercussions such as seizure of assets and exclusion from the US financial system. This article highlights the primary legal risks of such practices and suggests key steps for members to avoid unwanted repercussions.

How are STS transfers used to evade sanctions?

STS transfers are the transfers of crude oil, petroleum products, liquid bulk chemicals and liquefied gas between tankers while at sea, without the vessel having to call at a port or other facility.

Many STS transfers are legitimate; however, suspicious circumstances such as operations at night and in high-risk areas, anchoring or drifting near sanctioned countries, and missing AIS data should raise immediate concern.

Mitigating legal risks



Left : Salvage master **Piet Sinke** Bringing the **ALFALIFT** alongside the **EVERTON** for STS ops off the Oman coast as seen above.

There are serious consequences from breaching sanctions, and it is paramount that members are aware of these. Non-compliance with sanctions or related regulations may trigger wide-ranging repercussions from authorities and counterparties, jeopardize insurance cover, and expose the party in breach to acute financial- and reputational

difficulties.

To avoid this, due diligence before, during and after STS operations is paramount.

Local regulations concerning STS operations

Some states, for example Malaysia, require specific permission for anchoring and for conducting STS. There are several examples of the Indonesian Coast Guard detaining and expelling vessels due to unlawful STS operations and lack of required permits, causing arrest of vessels and lengthy delays.

A counterparty vessel involved in sanctions breaches may purposefully seek to evade such rules as they increase attention from local authorities. Hence, when planning STS within a state's maritime zone, it is of paramount importance to ensure that the parties involved comply with all local regulations. We recommend that members check with local agents and correspondents to ensure compliance.

Identity and status of counterparties

It is essential to know who is involved in the STS operation, and whether that party may be subject to sanctions; either through the corporate entity itself, or associated companies, vessels, governmental bodies or involved individuals. Extra caution is recommended if the STS operation is near to sanctioned countries.

Key elements in proper due diligence include:

- Identifying those connected to the STS operation, i.e., counterparty vessel owners, shippers, receivers, and any intermediaries.
- Checking the counterparty vessel against involvement in sanctions breaches. Researchers at the security think tank C4ADS published a report in September 2021 stating that nearly a dozen vessels had used identity theft to evade sanctions, for instance through using false AIS transmissions or setting up fictitious vessel registrations with IMO numbers of non-existent vessels.
- Scrutinizing the corporate structure, control and ownership of all companies involved.
- Recording evidence of proper due diligence procedures in case an issue arises later.

Origin of cargo

Sanctions-evaders frequently use STS transfers to falsify the origin of oil cargo, for instance by using countries close to the transfer location rather than the actual origin.

Key elements to mitigate risk include: Check the cargo information and know as much as possible about what is being transferred.

Pay close attention to Certificates of Origin – unfortunately, fraudulent Certificates of Origin have been used to conceal the origin of cargo from Venezuela or Iran.

Review all relevant shipping documentation to ensure that the correct details about the cargo, voyage, involved parties, and vessel particulars are recorded.

If necessary, a more extensive list of load port documents can be requested to verify the origin of the cargo, such as for instance certificate of cleanliness, port logs, ship/shore agreements, ullage reports, the material safety data sheet from the cargo producer, pre-load surveys etc. These documents should be stamped and signed, also by third parties, which may clarify regarding any suspicious activity.

Has the cargo passed through the custody of any intermediaries before reaching the current vessel? If so, investigate closely who and where.

Know the destination of the cargo and any intermediate destinations. Counterparty vessel movements AIS manipulation is often used by vessels involved in sanctions violations, and therefore we advise members to check carefully the AIS history of their counterparties:

- 1- Check for disabling of AIS, before and during STS transfers.
- 2- Monitor the vessel's movements during and before STS operations to ascertain if there is a history of irregularities in AIS activity.
- 3 -Check for AIS history before entering into contracts involving STS transfers.

Contract clauses

In addition to sufficient due diligence prior to and during STS transfers, appropriate contract clauses may provide legal and economic protection.

Sanctions compliance

The industry has developed several standard clauses regarding sanctions compliance. For STS operations, charterparty clauses are most relevant, and we recommend considering the wording from for instance BIMCO or Intertanko and adapting it to the specific needs and activities in question.

A good sanctions clause should include a warranty that none of the parties and their associated companies are subject to sanctions. If possible, shipowners may also ask charterers for a warranty that cargo interests, sub-charterers, and their affiliates are not sanctioned.

In addition to warranties directed at counterparties, shipowners may seek protection by obtaining a warranty from charterers that the trade is not sanctioned.

Drafting tips:

Clauses should be wide enough to warrant against sanctions directed at specific types of cargo (due to origin or particulars).

Charterers may be required to warrant that the particular cargo is not sanctioned; corresponding clauses should be inserted into associated contracts (sub-charterparties, sale contracts etc.).

Warranties provide better protection if they cover the entire performance of the contract (not just when it is concluded).

Rights and limits of sanctions clauses It is important to consider the rights and limits of sanctions clauses. To avoid being implicated in case of a counterparty becoming subject to sanctions, it is useful to have a right of termination in case of breach of sanctions.

Members are also advised to consider the consequences if sanctions arise during performance of the contract. These will be quite different depending on the trade in question.

Drafting tips:

Clauses should regulate when and how shipowners may refuse to complete STS.

The parties should agree what is to happen to the cargo if sanctions issues arise during operations, including when shipowners may refuse STS and what the consequences should be.

Right to refuse STS should be triggered in the following circumstances:

- Counterparty vessel owners/beneficial owners are sanctioned.
- Counterparty vessel is sanctioned.
- Counterparty vessel is without AIS for a certain period.
- There are concerns about the cargo origin/destination.

Given the common connection between illegitimate oil trade and switching off AIS, we would also recommend to consider a clause regulating AIS activity, such as for instance the new BIMCBO AIS clause from July 2021, the aim of which is to allow shipowners and charterers to terminate contracts with any counterparties that switch off AIS for illegitimate reasons. It is essential to remember that contract clauses will not provide complete protection and should not be relied upon as a guarantee, especially since sanctions warranties are contingent upon the counterparty being able to pay, which sanctions issues may impair. Thus, we emphasize the importance of the actions recommended here to mitigate the legal risks connected with STS operations.

Source: Skuld

Inséré 08/06/22 NIEUWS NOUVELLES Enlevé 08/07/22

Russia fuel oil exports to Middle East, Asia at 14-month high

Combined Russian fuel oil exports to the Middle East and Asia climbed to a 14-month high in April as Russia seeks to establish alternative outlets for its fuel oil exports away from western markets shunning Russian oil exports, according to Vortexa Market Report. April exports to Asia were led by firm exports to Singapore and India that helped offset weaker than anticipated exports to China. Russia may seek to maximize exports to these regions as sanctions gain momentum (e.g. EU plans to ban Russian oil imports, May 15 wind-down orders by EU, UK on certain contracts take effect).

Tight global fuel oil supply and rising Mideast and Asian demand from utilities could also encourage Russian supply to flow east of the Suez.

According to Reuters, Russian fuel oil arrivals in the UAE oil hub of Fujairah are set to jump sharply to about 2.5 million barrels in May, data shows, in a sign that flows of Russian oil and refined products are shifting away from Europe. The arrivals in May are about 125% higher than April levels, and about 24% higher than a recent record in November 2021, the data from oil analytics firm Vortexa showed.

Russian fuel oil exports from the Black Sea ports of Taman and Novorossiysk to Fujairah are fairly common, but Baltic exports are much rarer and those flows have jumped sharply in April and May, the data showed. One trader said Reuters the increased volumes were mainly going into the bunkering pool in Fujairah- the world's third largest bunkering hub after Singapore and Rotterdam. Trading Russian crude and oil products has become more difficult as Western buyers avoid it in response to the Ukraine conflict. Large companies, including Shell, BP and TotalEnergies have already said they have stopped buying cargoes of crude oil and refined products of Russian origin. Major global trading houses are planning to reduce crude and fuel purchases from Russia's state-controlled oil companies as from May 15 to avoid falling foul of European Union sanctions on Russia.

Source : PortNews

Inséré 10/06/22 DOSSIER Enlevé 10/07/22

Thinking strategically about tank cleaning

Tanker Operators would benefit from thinking more strategically about tank cleaning, saving money over the longer term in water disposal costs from a slightly bigger upfront investment in cleaning equipment, says Dasic Marine.

Ian Rippon, sales manager of tank cleaning equipment company Dasic Marine, cites a customer in the milk industry (not in shipping), which was cleaning its tanks using a basic "spray ball" equipment, capital cost £200, and paying £40k annual water disposal costs.

It purchased a £2,000 cleaning machine tailored to the tank which did the cleaning job in much less time with much less water, reducing the water disposal costs to £800 a year.

Water from milk equipment cleaning contains fats so cannot be disposed of in normal sewage systems.

Tanker operators can be sceptical about the idea that they can learn something from the food processing industry. But the food industry's cleaning needs are very similar to tankers. Cleaning often has to be even more rigorous, to comply with strict hygiene regulations, while also under pressure to reduce costs and increase productivity, Mr Rippon says.

And where a tanker company will typically only buy traditional marine tank cleaning equipment once and then forget about it, a company processing food will upgrade equipment regularly, and expect improvements with each new purchase in terms of cleaning effectiveness, speed and water usage.

Tanker companies, with their excessive work load, do not typically think very strategically about tank cleaning – they will often only ask for new machines when their existing machine breaks due to bad maintenance, or they suddenly realise they need one for a new cargo or voyage to a part of the world with higher tank cleanliness demands, Mr Rippon says.

There are many ways tanker companies could benefit from thinking more carefully about their choice of tank cleaning equipment, he says.

A typical tanker may have 10 cargo tanks but up to 50 tanks in total, with the other 40 being tanks such as sewage, sludge, fuel and fresh water with a wide variety of sizes. But tanker companies will typically use the same large cleaning machine for all of its tanks, where it could use a smaller machine on these tanks and use much less water. Or they will clean tanks by hand, which means "man entry procedures" have to be followed, which is time consuming and potentially very dangerous.

For fuel tanks (smaller than cargo tanks), tanker operators could take advantage of machines developed for cleaning tanks in retail petrol stations that can be used remotely through a 3" opening and are explosion proof. These can clean a fuel tank with much less water than the large machines used for cargo tanks in as little as 10 minutes, he says.

The same machine can be used for sulphur tanks, as they are stainless steel and have chemical resistant seals developed for the chemical process industry.

One tanker operator would carry fuel oil and jet fuel in the same vessel alternately. You need to do a hard clean after carrying fuel oil. But it would do the same level clean after carrying jet fuel, when it only really needed to do a tank rinse, which could be done with much lighter equipment.

Bunker vessel operators, who may need to give their cargo tanks a thorough clean before dry dock, can reduce costs by using gas oil or kerosene for tank cleaning with 6mm nozzles on the tank cleaning machine to soak the bulk heads and soften the dirt, then change to 10mm nozzles to clean with hot water.

After washing, the kerosene (now mixed with vessel fuel) can be put back into its original container. It can be later sold or blended to fuel the actual bunker vessel. This will halve the amount of water you need for the final tank cleaning and mean much less wastewater contaminated with bunker fuel at the end, which is very expensive to dispose of.

Companies can also reduce tank cleaning costs from having smaller nozzles on board for tank cleaning equipment and using the appropriately sized nozzle. The standard 10mm nozzle might make sense for larger cargo tanks, but a 6mm nozzle would be adequate for smaller tanks, and this would save 10 cubic metres of water an hour, he says.

A smaller nozzle would also be adequate if you are just rinsing a cargo tank rather than cleaning it, as you need to do before putting food into an otherwise clean tank.

Sometimes crew seem to have a psychological attraction to using large nozzles. "You can hear the impact on the side of the tank, that's what they like. If they change to 6mm nozzles, you wouldn't hear it as much but it will still clean as effectively again saving 10 cubic metres of water an hour," he says.

Aside from the water disposal costs, using less water for cleaning also makes a tanker company more environmentally friendly, which is increasingly important for tanker operators.

Working with suppliers

While tanker operators may not have the time to work out themselves which nozzle is right for each task, they can ask their tank cleaning equipment supplier to take on this task, Mr Rippon says.

The tank cleaning equipment supplier can help create procedures showing exactly what equipment and set-up is most appropriate for each tank – typically a 10mm nozzle or cargo Tanks 2,3,4 & 5 and 6mm for 1s). Nozzles can be changed in just a few minutes by the crew. This can be specified in the operating procedures - exactly as the food industry does, he says.

The nozzles can easily be labelled showing which nozzle is most appropriate for which wash type, he says.

As an example of how an equipment supplier can make a task easier to manage, Mr Rippon cites an example of a supplier of lifting equipment to a ship where he was a superintendent. This supplier provided the strops, chain blocks and shackles colour coded for the year in a metal box. The next year when they needed recertification, they were swapped out recertified and then given to another vessel. In this way, the company helped make a time consuming and complex management task much easier for the superintendent, he says.

A similar service could work for ships, where a cleaning equipment company supplies a kit with different sized tank cleaning machines and nozzles tailored for the vessel or fleet labelled for which tanks they should be used for, or which grade of products. This kit can easily be returned for overhaul and returned to the vessel in a short time frame or circulated around the fleet guaranteeing availability of a tank cleaning machine, reducing the chance of expensive delays while waiting for machines to be repaired or delivered.

Mr Rippon's background after serving at sea with BP and Shell was as a superintendent in tanker operations, first with Clipper Tankers then technical manager with Carisbrooke Shipping and a technical superintendent with Whittaker tankers.

As a sales manager with Dasic, the biggest challenge is often getting a chance to talk to extremely busy superintendents to show how the company can help, he says.

Having introduced marine tank cleaning to the food and beverage Industries and working with them to tailor it to their specific needs, he would welcome more opportunities to explain how the marine Industry can benefit from the same savings.

Inséré 11/06/22 DOSSIER Enlevé 11/07/22

Why are third officers being paid less than coffee shop workers?

By: Nick Chubb

I recently came across a job advert for a third officer by one of the UK's major maritime industry recruiters, Faststream Recruitment. The advert offers the successful candidate "the opportunity to work with a leading cruise company, experience global travel, and enjoy an attractive package with lots of future possibilities," sounds great right?

In return, Faststream's cruise ship operating client asks for "experience in this rank on any type of passenger vessel," an "Officer of the watch CoC unlimited," and "the legal right to live and work in the EU." This all seemed perfectly reasonable to me, and a great opportunity for a junior officer, until I saw the salary. "

The client will offer the successful candidates up to \$16,000 per year with a 4:2 rotation." \$16,000. Let that sink in.

At today's exchange rate that equates to a UK salary of £12,613. For a third officer. With experience in rank. For a leading cruise ship operator.

If you assume that the successful candidate will work around 12 hours per day for the eight months they are on board, that equates to around £4.33 per hour. The minimum wage in the UK for an 18-21 year old is £6.15 per hour. The minimum wage for an under 18 year old in the UK is £4.35 per hour.

So that we are crystal clear, a leading cruise operator is attempting to employ EU deck officers for less money than an employer in the UK can legally pay a child. When I saw this I assumed it was a typo and, through the magic of LinkedIn asked the team to verify.

Faststream's recruitment manager told me: "The pay advised on the advert is correct. This position is working with a leading and very well established company – and with this opportunity they are offering an entry into the cruise industry". These officers are professionally qualified navigators and will be legally responsible for the safe navigation of a multimillion dollar asset and the lives of thousands of people. It takes a minimum of three years and a combination of practical training, academic study, and sea-going experience to obtain an unlimited Officer of the Watch Certificate of Competency. Even after all of the training, there is no guarantee that a cadet will obtain their officer's ticket. In the UK, and across the EU, we maintain exceptionally high standards for the certification of seafarers and those who cannot prove their competence simply don't get a license.

There is a great deal of skill and creative flair that goes into brewing good coffee. For the sake of reference, a leading coffee shop in the UK pays its entry level staff an average of £7.00 per hour. But the skills required and the level of responsibility involved in navigating a merchant ship versus making my morning macchiato cannot be compared. So how is it that the officers on board these particular ships are being paid less than my local barista? I'm no stranger to the employment economics of our global shipping industry, and that UK and European seafarers must compete in an international market. During my time at sea, I was lucky enough to sail with officers from all over the world; Russia, the Philippines, Ukraine, Indonesia, India, Poland, and Croatia to name a few. We always swapped stories about pay and conditions during long hours on the bridge. I never met any seafarer who bore the responsibility of stripes on their shoulders earning a wage as low as what's on offer here.

Though morally questionable in my opinion, Faststream and their client are not doing anything illegal here. The salary on offer from this job comes in above the minimum wage

of a number of EU countries, some of which have no lower pay limit. An irrelevant point, because EU minimum wages have no bearing on what happens at sea. But it also comes in just above the recommended \$1,822 a month minimum wage for a third officer set by ITF, ISF and ILO as part of the Maritime Labour Convention. However, comparing what's on offer here to the minimum international standards completely misses the point. When I think of the minimum standards set by MLC, I picture rusty bulk carriers operated by anonymous and unscrupulous owners who spend their days treading the thin line between costs and safety. I don't picture cruise ships carrying thousands of unwitting passengers. When all is said and done, this is a safety issue. When a leading cruise ship operator is willing to devalue critical skills by paying the officers stood on deck, who bear responsibility for the safety of passengers and crew, a paltry \$16,000, it makes a mockery of all of the important work done by industry to improve safety at sea in recent decades. If any ship operator is willing to cut a corner this important, it makes you wonder where else they are cutting corners. Further, I wonder how safe the passengers on board would feel if they knew that the officers responsible for navigating their ship were paid less than the taxi or bus driver that took them to the airport?

Unfortunately, I have no doubt that the roles will be filled. Across Europe, there are enough qualified junior officers scrabbling for work that doesn't exist to fill these roles many times over, even at this insulting salary. I believe wholeheartedly in free-market economics and that, above certain minimum standards, an employee's salary should be determined by supply and demand. But in this case, I believe the cruise operator is shortsightedly sourcing officers well below the market rate. Sooner or later, markets always correct themselves. In our industry, those corrections tend to come after catastrophic events. It is a repeating pattern I've seen play out many times; a ship operator sources the cheapest possible labour, they struggle with crew retention and quality, near misses increase but go unreported, eventually, something happens; lives are lost, oil is spilled, or a ship founders. I am lucky enough to often be asked to speak at events or privately brief clients on the future of the industry. A consistent question comes up wherever I go; how do we attract the next generation of talent and give them the skills to succeed? It's a simple question and I believe it has a simple answer. Hire good people, train them well, and most importantly treat them well. You don't need to pay people filmstar wages to retain them, but you do need to pay them a wage that reflects their skills and the gravity of the responsibility they hold. I hope for their own sake, and for the sake of the passengers and crew in their charge, that Faststream and their client realise the error of their ways before irreparable harm is done to the industry.

Source : Splash 247

Inséré 12/06/22 HISTORIEK HISTORIQUE Enlevé 12/07/22

Mercator- Bearing straight (IV)

The Wright Approach

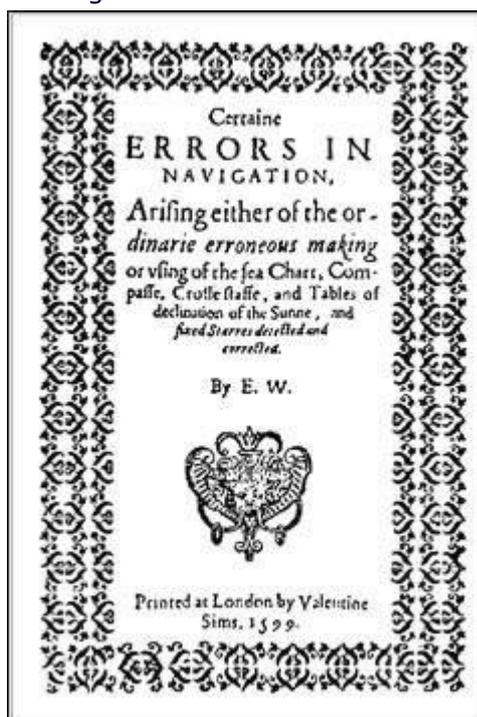
Edward Wright was a mathematician, not a mapmaker. Born in 1561 in the village of Garveston, about one hundred miles northeast of London, he attended Gonville and Caius College at Cambridge, where he received a bachelor of arts degree in 1581 and a master of arts three years later. In 1587 a research fellowship allowed him to focus on mathematical cosmography and its use in navigation. In 1589 a seven-month leave to help the Earl of Cumberland plunder Spanish shipping in the Azores provided practical experience at sea. Appalled by mariners' misuse of almanacs, charts, and navigation instruments, Wright undertook a mathematical critique of contemporary navigation. His

search for new solutions to old problems included a sea chart with straight-line loxodromes: the map Mercator had demonstrated but never explained.

Wright compared the projection to an inflatable globe inside a glass cylinder. Imagine a spherical bladder, he suggested, with meridians, parallels, and a selection of rhumb lines inscribed on its surface. Inflate the sphere initially so that its axis aligns with the axis of the cylinder and its equator just touches the glass. This step establishes the equator as the standard line, with the same scale on both globe and cylinder. Then slowly inflate the bladder so that all rhumb lines remain straight and the stretching at every point is the same in all directions—the angle-preserving condition now known as conformality. Although Wright's mythical model requires an infinitely expansive bladder of extreme flexibility, it describes perfectly the transformation of a globe into Mercator's conformal cylindrical projection: the parallels grow farther and farther apart as the bladder inflates, but because the cylinder is open ended, the poles never touch the map.

To describe the growing separation of the map's successive parallels Wright worked up a table with three columns. The first two list the degrees and minutes of latitude for parallels spaced ten minutes apart on the sphere, and the third reports the parallel's projected distance from the equator. Because the northern and southern hemispheres have identical grids, the table runs from the equator at 0° to a generic pole at 90°, and because a degree contains sixty minutes, an interval of ten minutes divides each half meridian into 540 (90 X 6) "meridional parts." To simplify the calculations, Wright set to 100 the distance encompassed by an arc of ten minutes at the equator. With minimal distortion near the equator, the parallels for 0° 10' and 0° 20' plot at 100 and 200 distance units, respectively. Because the table's third column has no decimal places, the slowly growing separation of parallels is not apparent until the sixteenth meridional part positions the parallel for 2° 40' at 1,601—up 101 units (rather than 100) from the parallel for 2° 30' at 1,500. Vertical stretching becomes only slightly more apparent at 15° 00', which plots at 9,104—only 103 distance units away from 14° 50', which plots at 9,001. Separations increase, and in its final rows the table locates the parallels for 89° 40' and 89° 50' at 201,513 and 226,223, respectively, and describes the polar parallel of 90°00' as "Infinite." With Wright's "Table for the true dividing of the meridians in the Sea Chart," any mapmaker or sailor could easily lay out a Mercator grid.

Wright used at least three decimal places in his calculations, but omitted them from the abridged table in the first edition of *Certaine* Figure 5.1 The title page of the first edition of Wright's treatise.



Errors in Navigation (fig. 5. 1), published in 1599, in order "not at this time to trouble [chartmakers and navigators] with more than thought to be of use." Another concern might have been his publisher's bottom line: the condensed table with a ten-minute interval occupies a mere six pages in the 1599 edition, whereas the complete table, with a one-minute interval and smaller type, consumes twenty-three pages in the second edition, published in 1610. Of little direct use to most readers, the added precision of 5,400 (90 X 60) small meridional parts minimized cumulative error.

However tedious, Wright's calculations are straightforward. The map's rectangular grid, which stretches the parallels to equal the equator in length, compensates for this increasing horizontal exaggeration by shifting the parallels farther apart vertically. The left part of figure 5.2 describes key elements in the calculation: a pair of meridians divide the equator and a parallel at latitude ϕ into sections with lengths c and c' , respectively. Note that

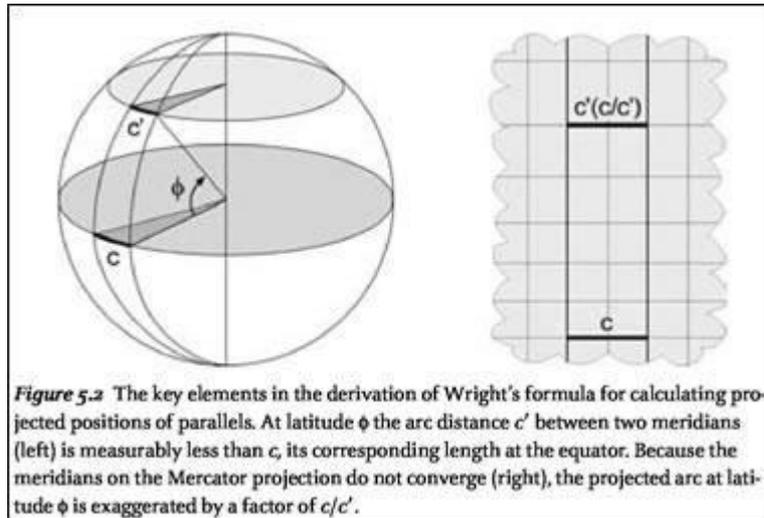


Figure 5.2 The key elements in the derivation of Wright's formula for calculating projected positions of parallels. At latitude ϕ the arc distance c' between two meridians (left) is measurably less than c , its corresponding length at the equator. Because the meridians on the Mercator projection do not converge (right), the projected arc at latitude ϕ is exaggerated by a factor of c/c' .

on the globe c' becomes progressively smaller than c with increasing latitude. Because the meridians on the map (right side of fig. 5.2) cannot converge, the mapped arc at latitude ϕ is stretched horizontally by a factor of c/c' . At 60° , where the full circumference of the parallel on the globe is half the length of the equator, the stretching ratio c/c' equals 2.0. Farther poleward, as the latitude approaches 90° , c' shrinks to zero and the stretching factor approaches infinity. Near the equator, though, east-west stretching is comparatively minor and the ratio is only marginally greater than 1.

Trigonometry conveniently enters the picture at this point because c/c' is the secant of angle ϕ . (In trigonometry the secant of an angle in a right triangle is the ratio of the length of the hypotenuse to the length of the adjacent side.) By consulting a table of secants, readily available to any late sixteenth-century university mathematician, Wright could look up the stretching factor for any latitude.

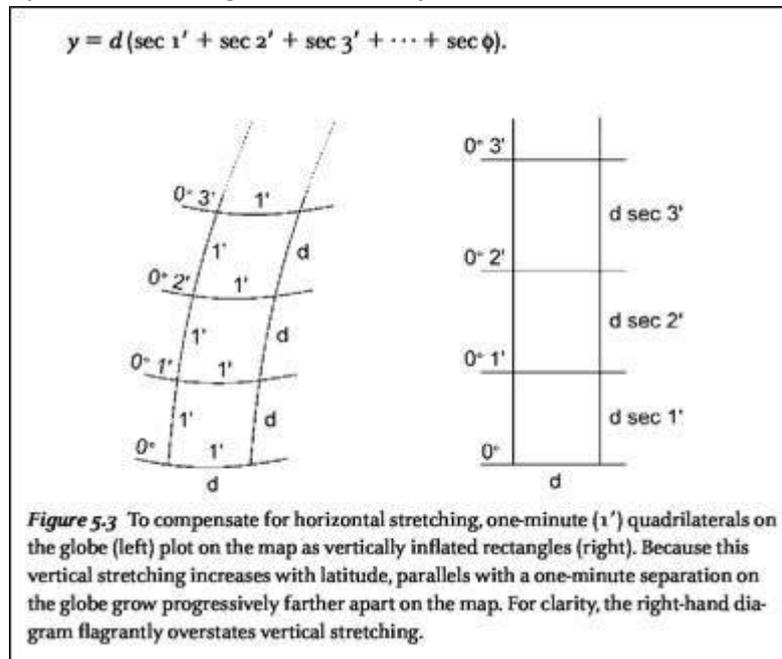


Figure 5.3 To compensate for horizontal stretching, one-minute ($1'$) quadrilaterals on the globe (left) plot on the map as vertically inflated rectangles (right). Because this vertical stretching increases with latitude, parallels with a one-minute separation on the globe grow progressively farther apart on the map. For clarity, the right-hand diagram flagrantly overstates vertical stretching.

The crux of Wright's method is a cumulative vertical adjustment for horizontal exaggeration. Figure 5.3 describes the process. A pair of meridians one minute apart define the east and west sides of a series of quadrangles covering one minute of latitude or longitude on all sides and extending upward from the equator. Stacked vertically, the quadrangles have curved sides on the sphere but plot as rectangles on the projection. Because the map's meridians cannot converge, the first quadrangle, which covers distance d along the equator,

must be slightly taller to compensate for east-west stretching along its upper edge, which is proportional to the secant of its latitude. Thus its upper edge, defined by the parallel at $0^\circ 1'$, is d times the secant of $1'$, which is written as $d \sec 1'$. Similarly, the height on the map of the second quadrangle, ever so slightly taller, is $d \sec 2'$, and the height of the quadrangle immediately above is $d \sec 3'$. As the diagram shows, the vertical distance from the equator to the parallel at $0^\circ 3'$ is the sum of the heights of these three rectangles. More generally, the map distance y from the equator to the parallel at latitude ϕ can be computed as

How accurate is Wright's table? To find out, I wrote a short computer

program—something cartographers rarely do these days, now that commercial software handles most mapping tasks.

Table 5.1 compares my results with Wright's abridged and complete tables, published in 1599 and 1610, respectively. Although the differences are more apparent for higher latitudes, where cumulative error should be most noticeable, the numbers are remarkably close. To put these

Table 5.1 Comparison of Edward Wright's abridged (1599) and complete (1610) tables of meridional parts with values computed electronically

Latitude	Wright (1599)	Wright (1610)	Computer (recent)
0°	0	0.0	0.0
10°	6,030	6,030.475	6,030.773
20°	12,251	12,251.292	12,251.772
30°	18,884	18,883.768	18,884.528
40°	26,228	26,227.559	26,228.430
50°	34,746	34,746.045	34,747.508
60°	45,277	45,277.106	45,278.680
70°	59,667	59,666.811	59,668.803
80°	83,773	83,773.416	83,775.782

discrepancies in perspective, I calculated the error (assuming my computer is reliable) for a world Mercator map three feet wide. At this scale the greatest discrepancy, a mere 2.366 at 80°, represents a nearly infinitesimal 0.00039 inches on the map—well within the tolerance of the most precise automatic plotters. It's hard not to be both amazed and impressed.

The calculations no doubt impressed mapmaker-engraver Jodocus Hondius, who was in London in the early 1590s, sitting out the Netherlands' version of the Spanish Inquisition. Hondius heard of Wright's work and borrowed a draft manuscript for a brief period after agreeing not to publish any of its contents without permission. But an accurate table of meridional parts was too great a temptation for the Dutch mapmaker, who drew on the English mathematician's labors for several regional maps as well as a world map he



Figure 5.4 The so-called Christian-Knight map, published in Amsterdam in 1597 by Jodocus Hondius, who used Wright's calculations without permission in laying out the projection. The original measures 15 by 19 inches (37 by 48 cm). From Shirley, *Mapping of the World*, 218, pl. 161.

published in Amsterdam in 1597 (fig. 5.4). No less apparent than the progressive poleward spacing of the map's parallels is the allegorical engraving of a Christian knight battling Sin, the Flesh, and the Devil. Hondius was mute about how he laid out the grid but dedicated the map, in Latin, to "Ed. Wrichto" and two other Englishmen. Wright was outraged. In the preface to *Certain Errors*, he quoted a letter in which Hondius had offered a vague apology: "I hear that you are somewhat offended with me because I have taken those few things out of your hand-written book.... Truly I told all my friends plainly that you are the author thereof, and I tell them so still." In what historian Lawrence Wroth termed "the most inept rationalization a plagiarist ever made," Hondius pleaded, "I was purposed to have set this forth under your name, but I feared that you would be displeased therewith because I have but rudely translated it into Latin." Neither moved nor mollified, Wright spared no sarcasm in condemning his former friend's deceit and greed: "But how well and honestly he [honored his agreement], grounded upon faith and credit, the world

may now see: and how thankful he hath been to me for that which hath been so profitable and gainful unto himself, as may appear by so common sale of his maps of the world, and of Europe, Asia, Africa, and America (all which had been yet unhatched, had he not learned the right way to lay the groundwork of them out of this book) I myself know too well. But let him go as he is."

The Christian-Knight map (as map historians call it) was not the only premature publication of Wright's results. His table of meridional parts appeared in print in 1594, in mathematician-navigator Thomas Blundeville's *Exercises for Young Gentlemen*, and again, three years later, in Sir William Barlow's *The Navigator's Supply*. Although both authors had obtained Wright's permission, only Blundeville acknowledged him by name. Barlow vaguely credited "a friend of mine of like profession." More devious was Abraham Kendall, a navigator with Sir Robert Dudley's 1594 expedition to Guiana and Trinidad. Kendall borrowed a draft of Wright's manuscript, made a longhand copy without permission, and carried it with him on Sir Francis Drake's 1595 expedition to the West Indies. Whatever his intentions, Kendall died off Porto Bello, and the manuscript found its way back to London, where someone, thinking it original scholarship, sent it to the Earl of Cumberland, who immediately recognized the work of his former hydrographer. According to maritime historian David Waters, two brushes with plagiarism—at the hands of Kendall and Hondius—convinced Wright to publish his book, which he gratefully dedicated to the Earl.

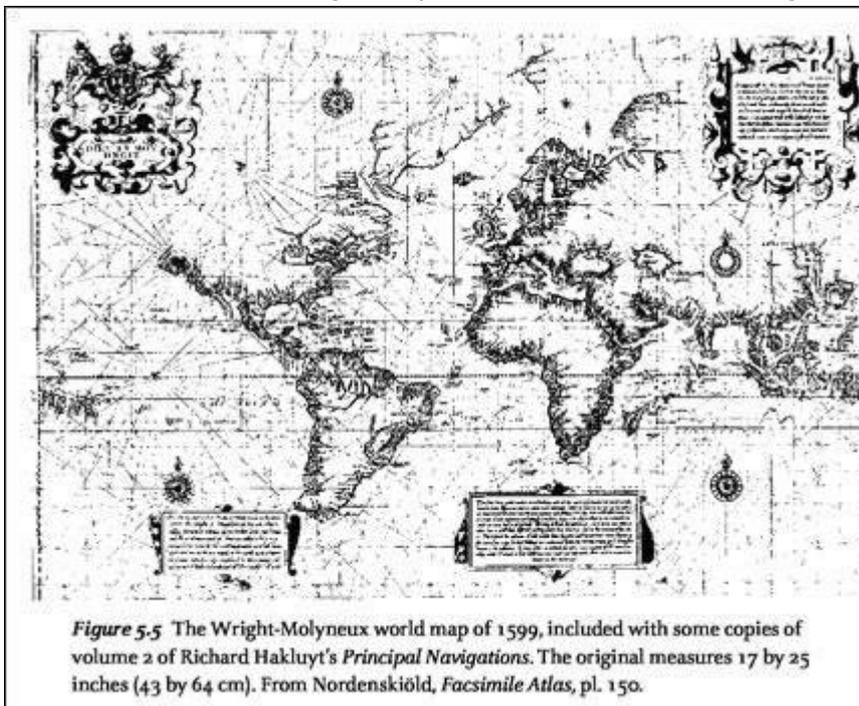


Figure 5.5 The Wright-Molyneux world map of 1599, included with some copies of volume 2 of Richard Hakluyt's *Principal Navigations*. The original measures 17 by 25 inches (43 by 64 cm). From Nordenskiöld, *Facsimile Atlas*, pl. 150.

Although Wright was neither the engraver nor the publisher, historians credit him with the two-sheet world map (fig. 5.5) prepared for the second volume of geographer-navigator Richard Hakluyt's *Principal Navigations, Voyages, Traffiques and Discoveries of the English Nation*, published in 1599. Sometimes called the Wright-Molyneux map because Wright laid out the graticule and transferred features from Emery Molyneux's 1592

terrestrial globe, the chart reflects recent discoveries by explorers like John Davis. Conspicuously absent are the northern Pacific coasts, the vast southern continent, and other questionable features that populate unexplored regions on most late sixteenth-century world maps. Hungry for accurate information, Wright and his co-compilers consulted the latest Dutch, Portuguese, and Spanish charts and amassed a total of 1,209 place names, mostly coastal. Acclaimed by the English intelligentsia for correcting numerous inaccuracies on existing charts, the map's fame is affirmed in act 3, scene 2 of William Shakespeare's *Twelfth Night*, in the line "He does smile his face into more lines than is in the new map with the augmentation of the Indies."

Wright died in 1615, knowing he had made an important contribution to navigation and cartography. Although his principles and calculations promoted a wider use of Mercator's projection—which a few logrolling British historians proposed calling the Wright-Mercator projection—it's now clear that another English mathematician, Thomas Harriot (1560–1621), had begun to address the problem of meridional parts around 1589, about the same time as Wright. What's more, Harriot's solution is cleaner and more mathematically elegant insofar as he had progressed from merely adding up secants, as Wright had done, to a

logarithmic tangents formula that affords a more exact and direct solution. We know this because Harriot left behind a massive collection of unpublished drawings, tables, notes, and manuscripts— over ten thousand pages worth, according to the Dictionary of Scientific Biography, which attributes his aversion to publishing to "adverse external circumstances, procrastination, and his reluctance to publish a tract when he thought that further work might improve it." A brilliant scholar with a profound understanding of astronomy and physics as well as mathematics, Harriot is the epitome of the perfectionist academic who rarely publishes.

Harriot's solution anticipated the serendipitous discovery of another English mathematician, Henry Bond (ca. 1600–1678), who around 1645 noticed a surprising correspondence between Wright's table of meridional parts and a table of logarithms of tangents published in 1620 by Edmund Gunter (1581–1626). It wasn't a direct

$$y = R \ln \tan (45^\circ + \phi/2),$$

correspondence—Bond had to reorganize Gunter's table to show logarithmic tangents of $(45^\circ + \phi/2)$, where ϕ is latitude—but once the numbers were rearranged, an exact match suggested strongly that the distance y from the equator of the parallel at latitude ϕ on a Mercator projection could be computed as where R is the radius of a globe that defines the projection's scale and in specifies a natural (or Napierian) logarithm. Bond's insight is important for two reasons. First, because the equation is not based on a succession of sums, it promotes a more straightforward, less error-prone calculation of projected coordinates using either a computer or a table of logarithmic tangents. (A moot point, perhaps, if Wright's table is at hand.) Second, and more important, as an equation readily manipulated using algebra and calculus, Bond's formula fosters a detailed mathematical examination of the projection's geometric distortion.

I looked in vain for a copy of the 1645 edition of Richard Norwood's *Epitome of Navigation*, in which Bond, who was its editor at the time, first published his observation. But no less than the eminent Edmund Halley confirmed Bond's discovery in a 1696 essay in the *Philosophical Transactions of the Royal Society of London*. Halley titled his article "An Early Demonstration of the Analogy of the Logarithmick [sic] Tangents to the Meridian Line or Sum of the Secants." After crediting "our Worthy Countryman Mr. Edward Wright" with a valuable table "to be met with in most Books treating of Navigation, computed with sufficient exactness for the purpose," he turned to the subject of his essay in noting, "It was first discovered by chance, and as far as I can learn, first published by Mr. Henry Bond, as an addition to Norwoods *Epitome of Navigation*, about 50 Years since, that the Meridian Line was Analogous to a Scale of Logarithmick Tangents of half the Complements of the Latitudes." Halley's article is important because he not only validates the Bond legend but also substantiates Wright's claim to priority. Like Wright, Halley was innocently ignorant of Harriot's unpublished solution.

Like most mathematicians I know, Halley was less concerned with the proposition's history than with its proof. An earlier proof, by James Gregory (1638–75), was hardly elegant, or as Halley saw it, "not without a long train of Consequences and Complications of Proportions, whereby the evidence of the Demonstration is in a great measure lost, and the Reader wearied before attaining it." And while subsequent attempts strayed from the point of Bond's discovery, Halley's own demonstration, the focus of his essay, was simple, on target, and probably original, as he boldly asserts in a remarkably candid and irresistibly quotable disclaimer:

Wherefore having attained, as I conceive, a very facile and natural demonstration of the said Analogy, and having found out the Rule for exhibiting the difference of Meridional parts, between any two parallels of Latitude, without finding both the Numbers whereof they are the difference: I hope I may be entitled to share in the improvements of this useful part of Geometry. Desiring no other favour of some Mathematical Pretenders, than that they think fit to be so just, as neither to attribute my desire to please the Honourable Royal Society in these Exercises, to any kind of Vanity or Love of Applause in me, (who too well know how very few these things oblige, and how small reward they procure) nor yet to complain, coram non iudice, that I arrogate to my self the Inventions of others, and

upon that pretext to depreciate what I do, unless at the same time, they can produce the Author I wrong, to prove their assertions. Such disingenuity as I have always most carefully avoided, so I with not too much experience of it in the very same persons, who make it their business to detract from that little share of Reputation I have in these things.

If Thomas Harriot had been as eager to publish, Edward Wright might be no better known today than Abraham Kendall or Henry Bond.

In a self-esteem contest, Halley could not hold a candle to Johann Heinrich Lambert (1728–77). During an interview for membership in the Prussian Academy of Sciences, Frederick the Great asked Lambert to name the science in which he was most proficient. Without hesitation, the candidate calmly answered, "All." Hardly an overstatement, though, for a genius whose contributions encompass mathematics, physics, astronomy, philosophy, and cartography. Born in Alsace to poor German parents and largely self-educated, Lambert worked as a clerk, secretary, and tutor before moving to Berlin in 1764. According to the Dictionary of Scientific Biography, his appointment to the Academy was delayed a year because of "his strange appearance and behavior." Lambert was openly religious, perhaps obnoxiously so, and he had an exceptionally high forehead, highlighted in the intriguing portrait (fig. 5.6) that decorates nearly every account of his life and work.

I suspect, though, that the engraver, working from sketches decades after his eminent subject's demise, exercised a bit of artistic license in endorsing popular ideas about superior intelligence and cranial capacity.



Figure 5.6 A lithographic engraving of J.-H. Lambert. From Maurer, "Johan Heinrich Lambert," facing 70.

Lambert's contributions to cartography include seven different map projections as

well as an illuminating mathematical analysis of conformality. In addition to using calculus to derive Bond's analytical formula for the Mercator projection, he demonstrated that the Mercator map is a "special case" in a family of conformal projections with polar and conic versions. As figure 5.7 illustrates, the cylinder and the plane are extreme forms of a cone tangent to the sphere along a "standard parallel."

Positioning the apex at infinity converts the cone to a cylinder, with the standard parallel at the equator. Putting the apex on the North Pole flattens the cone to a plane and shrinks the standard parallel (at 90°) to a point. If the projections are conformal, the cylindrical case is the Mercator, the planar case is the polar stereographic (in use since about 150 BC), and all intermediate cases are instances of the Lambert conformal conic projection, presented in 1772.

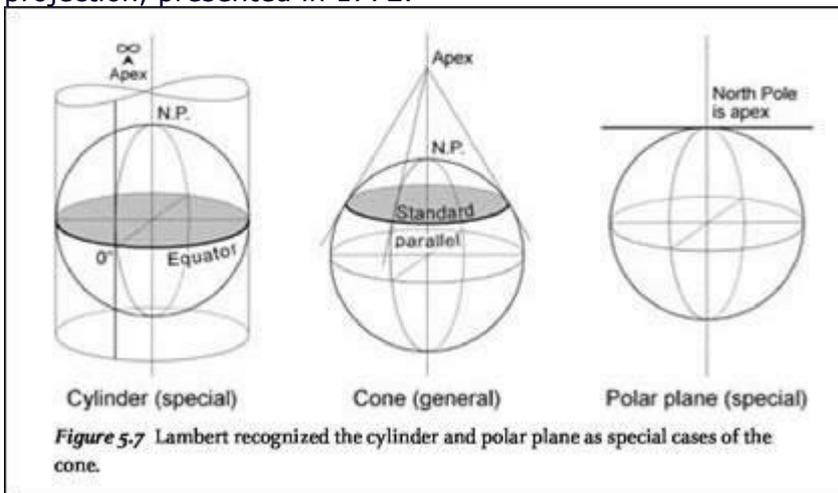


Figure 5.7 Lambert recognized the cylinder and polar plane as special cases of the cone.

Lambert's insight stimulated further work on map projection by three of the era's greatest mathematicians, Euler, Lagrange, and Gauss. For me, though, the next most decisive contributor is an otherwise obscure Paris mathematics teacher, Nicolas Auguste Tissot (pronounced "tea-so"), who devised an analytical description of map

distortion. (I searched for a biography or obituary, but found nothing.) Tissot's monograph *Mémoire sur la représentation des surfaces et les projections des cartes géographiques*, published in 1881, focuses on "the indicatrix," a simple device for describing distortion of angles and shape. Picture a globe with many small circles—infinitesimally small, in theory—all the same size. On conformal projections, which do not distort angles, the tiny circles remain circles but vary in area—as Mercator's map demonstrates, conformal projections

suffer severe areal distortion in zones far from a standard line. By contrast, on projections that are not conformal, compression and stretching deform most circles into ellipses as shown in the indicatrix in figure 5.8. In this example, point M on the circle corresponds to point M' on the ellipse, which reduces the angle ROR1 on the globe by an amount equal to twice the angle MOM'.

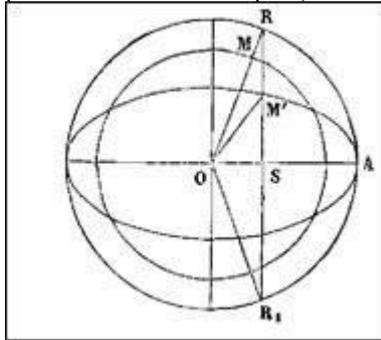


Figure 5.8 The indicatrix. From Tissot, *Mémoire*, 15.

Using calculus and his indicatrix, Tissot calculated areal distortion or maximum

angular distortion at grid intersections for a variety of projections, including Mercator's. In the next century his formulas helped analytical cartographers design customized projections that minimize distortion for specific regions.

As a graphic device for evaluating map projections, Tissot's indicatrix is unrivaled. Anyone who grasps the notion of a network of small, uniform circles on the globe can easily compare areal distortion on the Mercator projection with angular distortion on the Peters map. On the Mercator map (fig. 5.9, left) small circles grow ever larger with increasing distance from the equator—the price of preserving angles and loxodromes on a rectangular projection. An altogether different trade-off arises with the Peters projection (fig. 5.9, right), on which perfect shape

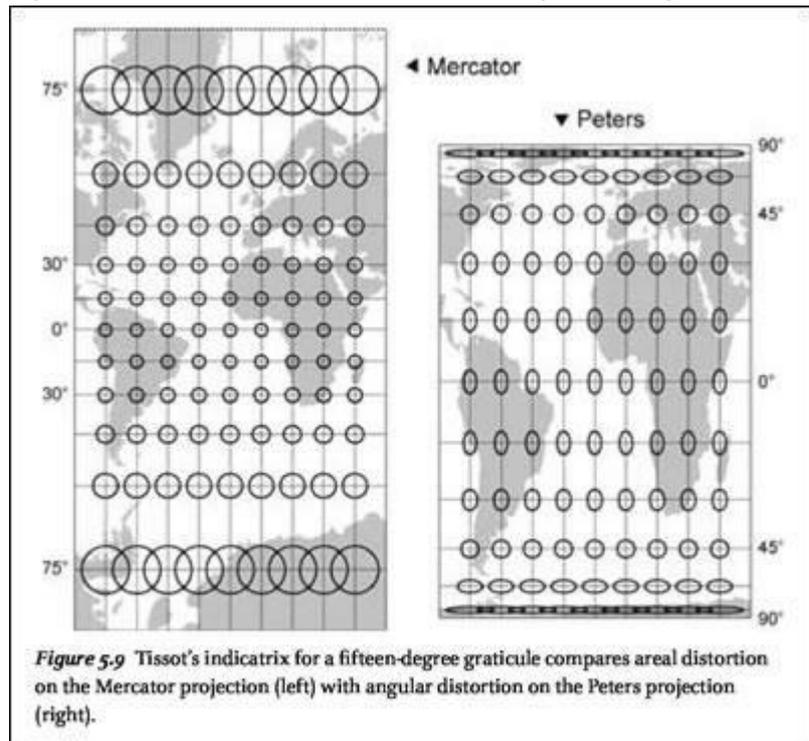


Figure 5.9 Tissot's indicatrix for a fifteen-degree graticule compares areal distortion on the Mercator projection (left) with angular distortion on the Peters projection (right).

at 45° N and S gives way to severe north–south stretching in the tropics and an equally troubling east–west wrenching around 75°, where severely deformed ellipses overlap. In neither case would the indicatrix be plotted at the poles, where east–west scale is indefinitely large. In chapter 9, Tissot's clever device supports an insightful appraisal of promising substitutes for the Peters projection, such as those of Robinson and Goode.

Given Tissot's contribution to the visual evaluation of map projections, it's ironic that his treatise contains very few diagrams and no maps. Hardly surprising, though: mathematicians like Lambert and Tissot were numerical theoreticians, not mapmakers. Proficient in successfully attacking important cartographic problems analytically, they had little concern for the practical implications of their work.

Inséré 13/06/22 NIEUWS NOUVELLES Enlevé 13/07/22

Germany to break free from Russian gas with two LNG terminals

Germany has revealed plans to build two liquefied natural gas (LNG) terminals in the near future in an effort to reduce its dependence on Russian gas.



This was announced by German Chancellor **Olaf Scholz** at a special session of the Bundestag on 27 February 2022 addressing Russia's attack on Ukraine.

As informed, the LNG terminals are planned to be located in Brunsbüttel and Wilhelmshaven.

Currently, there are several liquefied natural gas terminals in Europe, however, none of them are located in Germany.

Security of energy supply

Scholz also confirmed the country will increase the amount of natural gas in storage via long-term options to two billion cubic meters.

Furthermore, Germany will acquire additional natural gas on the world markets – in consultation with the European Union.

With these decisions, the government wants to guarantee a secure energy supply for Germany and eliminate dependence on imports from individual energy suppliers. Last week, Germany halted the process of certifying the Nord Stream 2 gas pipeline from Russia in response to the crisis in Ukraine. Nord Stream 2 construction was completed in September 2021 but the project requires regulatory certification from Germany before gas delivery could begin.

"The events of recent days and weeks have shown us that responsible, forward-looking energy policy is not just crucial for our economy and our climate," Chancellor Scholz stressed.

"It is also crucial for our security. This means that the faster we make progress with the development of renewable energies, the better."

According to Scholz, the short-term goals are in line with Germany's long-term strategy that includes the ongoing transition to a low-carbon economy. The country aims to become carbon neutral by 2045.

"Our current short-term needs can dovetail with what is already needed long-term for the transformation to succeed," Scholz added.

"An LNG terminal that today receives gas can tomorrow be used to import green hydrogen."

Scholz also touched upon high energy prices and said the government has agreed on a relief package that includes lifting the surcharge under the Renewable Energy Sources Act by the end of this year.

Energy Minister: "We must make ourselves self-sufficient"

Olaf Lies, Lower Saxony's Energy Minister has welcomed Scholz's announcement on the planned construction of LNG terminals that would ensure the necessary infrastructure for the import of LNG.

"We must make ourselves self-sufficient from one-sided dependencies as quickly as possible. There is no longer any doubt that imports from Russia can no longer form the basis of our security of supply," Lies said.

He pointed out that Germany needs to create new facts in terms of energy policy. To do this, the country is required to make "courageous" decisions in three areas.

Firstly, Germany must expand renewable energies even faster, Lies believes. The expansion of renewables will give the country freedom and independence from energy policy blackmail attempts, according to Lies.

Secondly, Germany needs to ensure that its strategic coal and gas reserves are sufficient, Lies noted.

Thirdly, the necessary infrastructure for importing liquid gas in the short term needs to be created – initially as an interim solution for fossil gas and later to be able to switch to the supply of green, climate-neutral gas.

"Right from the start, we have to think about the currently needed LNG terminals in such a way that they can be used for both. They must be green gas ready. This is not only technically possible but it is also part of the concepts for such a terminal in Wilhelmshaven," Lies explained.

"We as a state will ... do everything we can to advance the planning together with the city of Wilhelmshaven and the federal government. We can manage to start landing liquid gas as early as 2024. To do this, we have to take planning shortcuts wherever and whenever possible," he concluded.

Gasunie developing LNG terminal in Brunsbüttel

Gasunie, a Dutch operator of energy infrastructure in the Netherlands and Germany, said it will take extra steps in the coming period to safeguard the security of gas supply for the Netherlands, Germany and Europe.

In concrete terms, this involves the construction of a new storage terminal for LNG and sustainable energy in Brunsbüttel.

Gasunie is also investigating the possibility of further increasing its LNG import capacity into the Netherlands before the end of the year. These steps are taken in close cooperation with the German and Dutch governments, the Groningen-based company said.

As informed by Gasunie, one of the two LNG import terminals announced by Scholz is a terminal in Brunsbüttel that Gasunie is developing.

"Talks with the German government about the construction are in the final stage. Gasunie hopes to start construction of the terminal before the end of the year. In addition to LNG, this terminal will be made suitable for importing (green) hydrogen as well," Gasunie said in a statement.

Gasunie announced it will also freeze all non-operational relations and contacts with Russian companies, such as Gazprom. On the basis of its 9% shareholding, Gasunie's CEO has a qualitative seat on Nord Stream's Shareholders Committee. In light of current developments, **Han Fennema** is suspending his activities in this regard.

Cooperation in knowledge-sharing and scientific development is also halted

Inséré 14/06/22 NIEUWS NOUVELLES Enlevé 14/07/22

Special waterway transport: Enormous concrete threshold for storm surge barrier from Kallo to Nieuwpoort

- In Kallo, Flemish Minister of Mobility and Public Works Lydia Peeters gives the go-ahead for the pontoon that will be sailing the concrete threshold for the storm surge barrier to Nieuwpoort.
- This concrete threshold will be installed in Nieuwpoort between the two abutments, an important milestone in the construction of the storm surge barrier.
- Jan De Nul and Herbosch-Kiere jointly built this enormous threshold of 4,570 tonnes, 23.5 metres wide, 42.1 metres long and 5 metres high.

Within the next few days, a special transport will leave Kallo, in Port of Antwerp. A pontoon carrying an enormous concrete threshold. Final destination: Nieuwpoort harbour channel. This is a major component of the storm surge barrier currently under construction by the Agency for Maritime Services and Coast (MSC). This storm surge barrier will protect Nieuwpoort against extreme storm surges. Minister for Mobility and Public Works Lydia Peeters came to have a look at how this enormous threshold is being completed.

23.5 metre wide, 42.1 metre long and five metre high, that is the size of this concrete threshold that was under construction at Kallo over the past few months. This threshold will soon be installed in the harbour channel at Nieuwpoort between both abutments of the storm surge barrier. Later, it will hold the steel barrier in normal, open position.

"The construction of the storm surge barrier is unique in our country," explains minister Lydia Peeters. "When I see the threshold lying there, then the transport alone can be considered a real feat. Many different parties worked together to get the threshold safely at its final destination. Everyone who took part in this project has a right to be proud of being involved in the process as a whole." "The storm surge barrier is necessary to protect Nieuwpoort and the hinterland against floods," says minister Lydia Peeters. "Nowadays, coastal harbours are the most at risk of floods when storm surges occur. Nieuwpoort too is currently still unprepared for the high water levels that can occur during heavy storms. For the protection of Nieuwpoort, at the Flemish Authority we are currently investing M€ 58 in the construction of storm surge barriers in the Yser estuary. The infrastructure is one of the measures in the Coastal Safety Master Plan that will protect our whole coastline against heavy storm surges until 2050." Dirk Van Rompaey, Director Civil Engineering Works at Jan De Nul Group: "Our Belgian coast is vulnerable to rising sea levels. The storm surge barriers being constructed by Jan De Nul in Nieuwpoort fit in a series of public measures aimed at protecting 67 km of coastline. It is a unique hydraulic structure in which civil engineering and maritime technology know-how and expertise join forces. Quite fitting for Jan De Nul. The Immersing the concrete threshold is a major milestone in this project. An exploit achieved by Jan De Nul in cooperation with Herbosch-Kiere." Benny De Sutter, CEO Herbosch-Kiere: "Since the works were performed in our premises in Kallo, we have the privilege of monitoring its progress on a daily basis and seeing it grow. That was a special experience for our people, here at the office. The activities on this impressive and gigantic structure went very smoothly and we are proud of our colleagues who devoted their efforts in a flexible and professional manner over the past period. We are absolutely ready for this adventurous journey to the final destination of the threshold in Nieuwpoort."

Water transport

Getting the threshold from Kallo to Nieuwpoort can definitely be qualified as special transport. The threshold is built onto a pontoon that can be submerged. Two tugboats first pull the pontoon through the Scheldt, and then over sea to the harbour in Ostend. A trip that will last about twelve hours. For the transport over the Wester Scheldt and over sea,

several links in the nautical chain work together closely. The Common Nautical Authority (CAN) gives approval for the river leg, and the Maritime Rescue and Coordination Centre (MRCC) issues the permit for the sea leg. For both the part of the trip on the Scheldt and over sea up to Ostend, a pilot will be on-board.

Permits have been issued for this special transport, stipulating certain safety conditions.

Upon arrival in Ostend, everything preventing the threshold from shifting or tipping over during transport (seafastening) is removed. Then, the threshold is hooked onto a crane on a second pontoon, the Matador III. The concrete threshold weighs more than 4,500 tonnes. Too heavy to lift for the Matador III. If you still remember Archimedes' Law, you will know that a submerged object is lighter to lift. Therefore, the pontoon will be submerged so that the threshold is entirely covered by water. The load to be lifted then 'only' weighs 1,210 tonnes. This operation takes 16 to 20 hours. A number of checks will still need to be carried out. Only then will the threshold, suspended from the crane on the Matador III, be ready for the last leg of the trip to Nieuwpoort. This journey takes approximately six hours.

Once the threshold has arrived in the harbour channel at Nieuwpoort, it is lowered between two abutments. This takes approximately 1 day. Finally, the threshold still needs to be anchored. For this, the harbour channel will be closed off completely for about 10 days. During the whole process in Nieuwpoort, divers are present to check that the positioning happens correctly.

Work sequence

Installing the concrete threshold is a major milestone in the construction of the storm surge barrier. The MSC Agency launched the works in the spring of 2018. In the Nieuwpoort harbour channel, both concrete abutments and guide walls were built and the trench for the laying of the threshold was excavated. This autumn, construction works will start for the bypass drains. These are lateral pipes in each of the abutments. They will ensure that the spring tide flow rate never exceeds three knots. Then, the steel barrier still needs to be installed, as well as the mechanical parts and the fenders, and the service building will be installed on the abutment on the right bank.

The project should be completed in 2025.

Background information storm surge barrier

When a storm surge is forecast, the storm surge barrier will close off the harbour channel, so that the water cannot flow into the harbour and the hinterland. The protection offered by the storm surge barrier is already needed in the case of 10-year storm surges. However, this barrier will also protect against 1000-year storm surges. The design takes into account an 80-centimeter sea level rise by the year 2100.

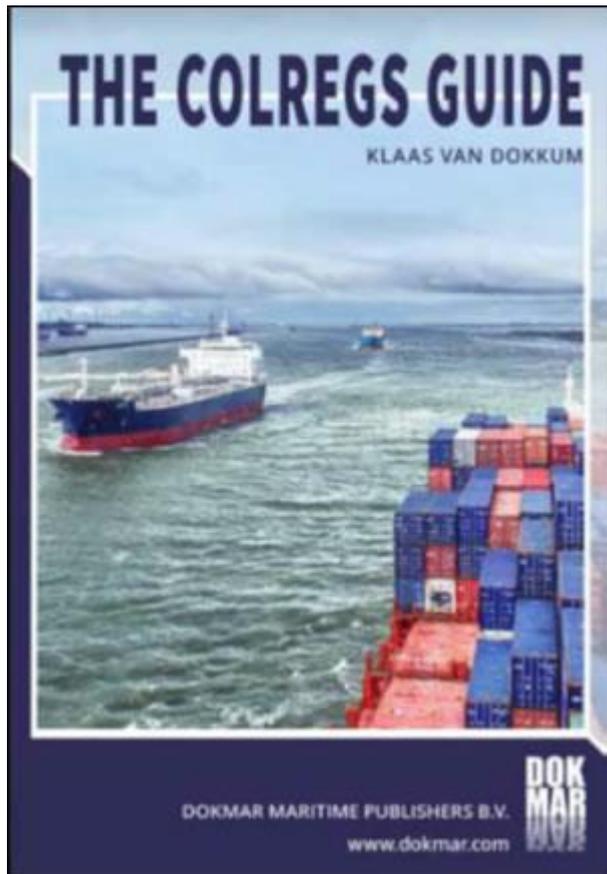
The threshold in numbers

- Weight: 4,570 tonnes
- Dimensions: 23 metre wide, 42.1 metre long, 5 metre high
- 1,732m³ concrete
- 572,450 kg reinforcement steel

If you want to know how the storm surge barrier will work, check out www.stormvloedkeringnieuwpoort.be for further information.

Inséré 14/06/21 BOEKEN LIVRES BOOKS Enlevé 14/07/22

“The Colregs Guide”



Dokmar Maritime Publishers BV in Holland recently issued the 7th edition of its popular title "**The Colregs Guide**" written by **Klaas Van Dokkum**. The contents of the book has been completely updated. The same title is **also available in the Dutch and German language**. The convention on the International Regulations for Preventing Collisions at Sea, otherwise known as 'Colregs', are applicable to everyone who goes to sea. The rules themselves and their interpretations must be clear to everyone, regardless of training and whether on a surfboard, cruise ship or supertanker. Through the many photos and computerized renditions, the system of navigation lights on different types of ships becomes readily understandable.

Priority rules are illustrated by views from the air and from the bridges of vessels involved.

This book is applicable for both those engaged in self-study and student at all levels of professional training.

"**The Colregs Guide**" (ISBN 978 90 71500 54 1), a 224 page hardback publication costs 35.00 euro, incl. P&P. It can be bought in the specialized bookshop or direct with the publisher, **Dokmar Maritime Publishers BV**, PO Box 5052, 4380KB Vlissingen, The Netherlands. Phone +31(0)612.3506150, e-mail: info@dokmar.com, website www.dokmar.com.

Inséré 16/06/22 DOSSIER Enlevé 16/07/22

Rotor sails on tankers

Rotor sails on tankers could save 17 per cent of fuel, estimates wind technology provider Anemoi By Nick Contopoulos, COO, Anemoi



Rotor sails are tall cylindrical sails that can be installed on the main deck, bow or elsewhere with sufficient space. Anemol Marine, a provider of wind technology, has reimagined the concept as a modern-day solution that can help facilitate the push towards industry-wide decarbonisation.

Anemol believes rotor sails offer an immediate and compelling solution for tanker owners.

Anemol estimates that a 50,000-dwt MR Tanker with two Anemol rotor sails installed and travelling between New York and Rotterdam would save 16.9 per cent of fuel, equating to 557 tonnes of fuel saved per year and 1786 tonnes of carbon avoided.

A 300,000-dwt VLCC with six Anemol Rotor Sails installed and travelling between Bonny (Nigeria) and Ningbo (China) would save 17.3 per cent of fuel, meaning 2197 tonnes of fuel saved per year, and 7044 tonnes of carbon avoided.

How it works

An electric motor is used to rotate the sails in order to harness the power of the wind and propel the ship.

The Rotor Sails make use of the aerodynamic phenomenon known as the 'Magnus Effect'. As the cylinder rotates within an airflow, a forward thrust force perpendicular to the apparent wind direction is created, which delivers additional thrust to the vessel.

The thrust generated can either provide additional vessel speed or maintain vessel speed by reducing power from the main engine. The obvious benefit from this is less fuel burned and reduced emissions.

Installing on tankers

Installing Anemol technology on a tanker can be a straightforward process.

This is because wholesale changes to the vessel structure, or dry docking, is not necessary. Rotor Sails and all associated equipment are delivered to the dockside, ready for installation. Our specialist and highly trained team then supervise the full equipment installation.

Each Rotor Sail is installed in a single crane lift and connected to the foundation on the ship's deck. Each Rotor Sail can be fitted to the deck in less than a day, once the vessel's structural, mechanical and electrical integration work is complete.

Prior to this taking place, a feasibility study, unique to each vessel, will have been conducted to determine the optimal size, number and position of the Rotor Sails.

This is to maximise performance within the vessel's operational constraints and identify whether a Deployment System (equipment which allows the rotors to be moved on the deck of the ship) is required for the vessel.

Compared to other vessel types there are additional considerations for tankers, such as hazardous areas /explosion-rating, port working areas (hose crane/manifolds), navigation and helicopter ops, deck pipework and out-fittings and deck space and structure.

However, there is vast potential for tankers, with the available deck space. This results in a lower complexity integration design and plan approval.

The CAPEX and maintenance requirements for a tanker installation are also typically lower compared to a bulker as the additional Deployment System equipment to address cargo handling is not required, making tankers ideal candidates for wind propulsion.

The vessel integration stage is crucial to the process and we support clients at every stage, including the design and installation supervision of the structural foundations and the electrical cabling from the vessel main switchboard to each Rotor Sail.

The vessel integration can be completed during the construction phase of a newbuild vessel, or during a survey at a shipyard for a retrofit vessel. Once the Rotor Sails are installed and all cables are connected, we complete final commissioning of the system, and crew training, prior to handover.

Ease of use

The Anemoi Rotor Sail System is comprised of the Rotor Sail itself, the Foundation, Deployment System (if required), wind sensors and Electrical, Control, and Automation systems.

The main components of our Rotor Sails are the "Rotor" (the cylindrical, rotating part), the tower, upper and lower bearings, and the electrical drive system.

The rotor is built from advanced lightweight composite material and the tower is a steel column structure. We use these materials to ensure maximum performance of our rotor sails and to withstand all weather conditions. The lightweight materials that are utilised also means that our systems minimise reduction in cargo carrying capacity and are typically less than 0.2% of vessel deadweight.

The Rotor Sails have a control station located on the bridge. This automatically controls the speed and direction of the Rotor Sails, as well as monitoring the performance and status of the system.

Our control system is designed to maximise performance and minimise crew input with automated speed and direction setting, equipment monitoring, safety features and performance reporting to stakeholders using a ship to shore data transmission.

Regulation

The International Maritime Organization (IMO) wants considerable cuts in ship emissions as part of its 2030 and 2050 targets.

The goal is to reduce GHG emissions from vessels by at least 40% before the end of this decade and by at least 50% by 2050 (compared with 2008 baseline figures). The best-case scenario is full decarbonisation, although this will likely require a range of solutions.

The Energy Efficiency Design Index (EEDI) is already in place and has been created to ensure newbuild vessels meet requisite levels of efficiency. The Energy Efficiency Existing Ship Index (EEXI) is due to come into force by January 2023.

Carbon Intensity Indicators (CII), meanwhile, are also on the cards. These measures mean shipowners already have to carefully weigh up the options available to achieve compliance. Debate still surrounds the realistic timeline, availability and eco nature of alternative fuels. As a result, many shipowners are ready to take the plunge and invest in future proof technologies. Installing Rotor Sails as retrofit or newbuild could be the ideal answer for many tanker owners.

TankerOperator

Inséré 18/06/22 NIEUWS NOUVELLES Enlevé 18/07/22

High praise for South African seafarers following location of 'Endurance' wreck

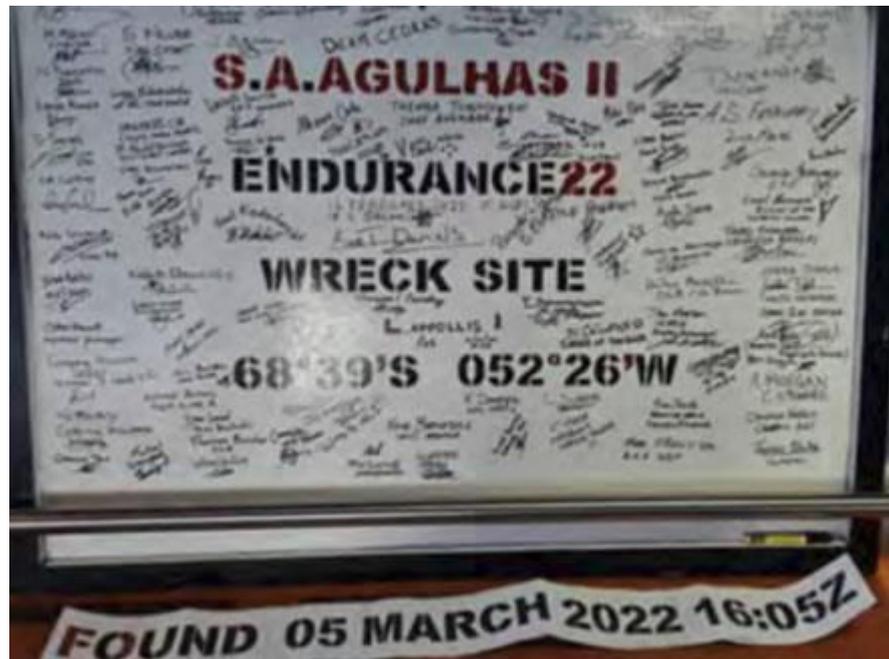
Local team proud to be part of this historic milestone –



The **Falklands Maritime Heritage Trust** announced that the wreck of Sir Ernest Shackleton's ship '**ENDURANCE**' lost in 1915, has been located successfully in the Weddell Sea. A multinational team of experts aboard the South African Antarctic Supply Vessel '**SA AGULHAS II**' departed Cape Town on 5th February on the Endurance22 Expedition.



On-board the vessel, 43 local seafarers under Captain Knowledge Bengu would provide critical support to the expedition team. Donald Lamont, Chairperson of the Falklands Maritime Heritage Trust, in a letter to Captain Bengu highlighted the essential role played by the South African ship: "As we began planning this expedition, we looked no further than South Africa for the ship we needed and for the Master, Ice Pilot and crew who could get us to where we are today. You have ensured that our expedition team had the right platform in the right place and at the right time. This is your success and that of those who serve under you."



This sentiment was echoed by Expedition Leader Dr John Shears who noted that the Officers and Crew of the 'SA AGULHAS II' had been "simply outstanding"; going on to thank all partners especially in South Africa who played a vital role in the success of the expedition. The SA AGULHAS II' is owned by the South African Department of Forestry, Fisheries and the Environment (DFFE) and the vessel is managed on their behalf by local company AMSOL. As the leading employer of South Africa seafarers, AMSOL ensured that client requirements were met over months of pre-voyage planning that included the implementation of stringent COVID19 prevention protocols, a seafarer vaccination programme, as well as local procurement to supply the vessel and specific Endurance22 Expedition requirements. The company was also able to provide training berths for five South African Cadets during the voyage; exposing these young men and women beginning their career at sea to a once in a lifetime experience. AMSOL's Chief Executive Officer Paul Maclons: "Since 2019, we have been proud to be part of the team involved in the quest to locate the wreck; a unique project that drew on expertise from across our company. On the occasion of this historic milestone I would like to congratulate the Falklands Maritime Heritage Trust and the Endurance22 Expedition team. I extend my thanks to Captain Knowledge Bengu, Officers, Crew and AMSOL support personnel for their professionalism and commitment to the objectives of this voyage."

Inséré 20/06/22 DOSSIER Enlevé 20/07/22

Ballast water regulations could lead to Significant costs for shipowners without thorough forward planning

Global ballast water regulations have been introduced to address serious economic, ecological and human problems caused by invasive species transported across the world via ships' ballast water. As these regulations are maturing, Ballast Water Management Systems (BWMS) are becoming a legal prerequisite to global trade Both the IMO and USCG provide clear standards for treatment that must be met. This standard is utilised by classification societies as they certify BWMS, providing shipowners clarity on the exact specification of the system they must install to be compliant. On paper, this makes ballast water simple for shipowners. This is undeniably true in one respect – it will soon be a legal

requirement for any ship engaged in international trade to have a certified way of treating ballast water onboard. The date of this requirement coming into force depends on the age of a vessel, corresponding to their next scheduled survey. This has created a natural glut of vessels requiring retrofits over the next few years, which is being heightened further by the extensions that some authorities have granted during the COVID-19 crisis. This glut creates two issues for shipowners in ensuring compliance today – securing an appropriate BWMS system, and ensuring that the system remains operationally compliant.



*The **EVER ACE** arrived in Hamburg Photo : Hans Schaefer (c)*

As bottlenecks look likely, thorough planning is key

A glut of ships requiring retrofits was always expected to lead to bottlenecks at shipyards as owners secure BWMS from 2021. This was true before the COVID-19 pandemic, and the regional and national lockdowns that came along with it, but has been heightened as shipowners have been permitted to delay retrofits. Without proper planning, these bottlenecks could mean shipowners facing expensive layups for their vessels.

Demand outstripping capacity at shipyards is a clear problem for owners. This risk can be mitigated by securing places in advance and putting together timelines around business priorities. Without proper planning, layups or inflated prices are inevitable. Similar issues are already prevalent in some areas with spare parts and maintenance. This expansion of demand, coupled with the logistical challenges caused by travel restrictions, has left some suppliers unable to provide adequate quantities of parts. At the same time, these restrictions and supply shortages are making it difficult to secure maintenance. Navigating the challenges requires more engaged planning, which continues even after a system has been fitted. Securing continual access to spare parts and access to maintenance across regions requires robust technical and supply chain planning.

Ensuring compliance after delivery

Investing in an approved BWMS is not a guarantee of continued compliance in all situations after that date. A system must continually treat ballast water to the IMO's D-2 standard or the USCG's approved standard in operation. This means that it must be operated correctly, it must be reliable, and it must be appropriate for use in the specific conditions needed for a vessel. The first issue many in the industry have faced involves training. Good crew training is one of the most important tools in a shipowner's arsenal for ensuring compliance, as it enables a crew to confidently operate and maintain a BWMS, and means they are less likely to make mistakes or misinterpret data – and makes it possible for crew members to recognise issues with a system. When done well, training helps crew members solve problems using a broad understanding of USCG and IMO regulations. Being able to discover, understand and effectively communicate issues with relevant authorities if they arise is invaluable in working under the current regime. Yet training has become a

significant administrative challenge, with over 100 different models of BWMS on the market with different operating manuals, and global travel restrictions making it difficult to secure availability for training. Securing and maintaining knowledge of a system throughout crew changes extends to ensuring that detailed records are kept for each relevant crew member and training is continually updated. Inappropriate crew training is likely to be one of the next areas that authorities seek compliance action over. It is easy for them to prove when a crew has not received proper training, and it is a shipowner's prerogative to ensure that crew have the right to training to ensure that an otherwise functioning BWMS is operated in compliance with the regulations. To support shipowners, De Nora offers and arranges training for shipowners who have installed a BALPURE® system as part of our aftercare. Where there is still an added need for recordkeeping, this approach removes some of the administrative hurdle shipowners have faced – especially during the COVID-19 pandemic. Yet, even with the best training there is always the potential for problems to go undetected. Often, BWMS issues are not clear upon a visual inspection, while the industry cannot expect crew be experts in marine biology when circumstances dictate more specialist knowledge than it is reasonable to call on someone to know.

Remote Condition Monitoring is thus becoming an essential part of any shipowner's ballast water compliance plans and procedures. De Nora BALPURE systems come with Remote Condition Monitoring as standard, allowing De Nora system experts to read and analyse system data remotely. This allows these system specialists to provide detailed guidance and feedback to crew and implement preventive or corrective maintenance in collaboration with them to reduce the risk of failure.



*The Dutch subsea rock installation (SRI) vessel "**BRAVENES**" (Van Oord) operating in the Maasmond (Rotterdam)*

Keeping risk under control

Comprehensive planning is the only sure fire way that shipowners can reduce their exposure to the risk of costly lay ups. Failing to secure space in a shipyard for a retrofit today will inevitably lead to complications as the market experiences bottlenecks at a later point. The same is true for training, spare parts, and maintenance. This planning will not end once a system has been installed and travel restrictions have ended. Instead, overcoming the administrative and technical hurdles now created will require a more forward thinking approach. BWMS suppliers have a responsibility to help shipowners deliver on this. At De Nora, we provide this support openly and honestly throughout the process – from the design of the installation to onboard condition monitoring. Market conditions are incredibly challenging right now, especially in markets where margins have tightened in recent months. Ballast water regulations have the potential to add significant additional costs when shipowners are hurting most, and it is vital that ballast water suppliers support the industry today by acting as a trusted partner. Similarly, it is important that shipowners mitigate their risk through forward planning.

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