# SWZ | MARITIME

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## Spatial planning in the NORTH SEA

### Container ship safety

**TopTier JIP seeks to restore confidence**

### Hypersonic missiles

**How will they impact naval shipbuilding?**

### The next frontier

**Floating offshore wind**

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Improve Quality. Reduce Risk.

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Our overcrowded country needs space to enable our energy transition, extend our agriculture and collect building materials while proceeding with the mining of fossils, fishing and recreating and continuing to give safe passage to ships.

## 36 | Hypersonic missiles disrupt naval warfare

Recently, North Korea, China and Russia tested hypersonic missiles. Australia, India, France, Germany and Japan are carrying out research. The US will accelerate developments and wants to start production next year.

## 39 | Restoring confidence in the safety of container ships

The loss of containers raised public and political concerns on the safety and environmental impact of modern container ships. In September 2020, MARIN launched the JIP "TopTier" to improve the safety of container handling and operation.

## Contents



*Cover: Solange van der Werff (TU Delft) visualised the intensity of traffic on the North Sea using AIS data. The more vessels cross the same area, the brighter the colour becomes.*

# The need for spatial planning

The cover of this December edition of SWZ|Maritime shows something different than what readers are usually offered. Instead of an often brand-new ship in its elements, we show a map of the Netherlands and a big chunk of the Dutch part of the North Sea. The brightly illuminated thick lines show the shipping routes. But it also shows a lot of other things as all the other smaller and bigger dots mean that there is something standing or floating at sea, such as offshore wind farms, with their turbines and transformer stations, the platforms, big and small, for the production of oil and gas, the designated anchoring areas for ships that wait to be dealt with at our ports and just here and there a fishing ship that catches badly needed healthy food for our dining tables.

All these functions at sea need construction, thinking and R&D to develop. Besides the bigger ships that are mostly designed and built in Asia nowadays, a lot of the fixed or floating objects and the smaller ships are still built at Dutch yards. And what this map shows very clearly, is how busy the North Sea is. It has long ceased to be that large open, empty plain where you don't meet anyone until you reach the other side of the sea or ocean. On the contrary, sailing the North Sea means taking into account more and more rules, injunctions and prohibitions.

Dutch fishermen in particular are experiencing ever more restrictions in practising their profession. For them, the headline on the cover of spatial planning means more and more often a battle for space, just like the farmers on land that are constantly faced with the encroachment of housing and business activity. And just like on land, politicians have to choose constantly who gets priority. The government has developed spatial planning to bring the different interests in a dynamic balance and this will also have to happen for the North Sea.

Our editor Johan de Jong from MARIN has put this issue on the agenda of SWZ|Maritime by coordinating a range of articles about this subject with contributions of Rijkswaterstaat (the Dutch Directorate-General for Public Works and Water Management), fisheries lobbyist Pim Visser, Lloyd's Register's George Kallenos, and our editor Sander Klos. And if the cover picture intrigues you as it does me and are interested in what digitalisation of processes can offer us in terms of new interesting insights, you have to read the article of PhD candidate Solange van der Werff of the TU Delft. I hope our readers will enjoy reading these articles just as much as I have.

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SWZ'S EDITORS

## MARIN receives honorary Marine Engineering medal from KIVI

The Royal Netherlands Society of Engineers (KIVI) has awarded an honorary medal for Marine Engineering to the Maritime Research Institute Netherlands (MARIN). The medal is awarded every four years to a person or organisation that has made an outstanding contribution to the maritime sector. MARIN was chosen because of the way it has stimulated the Dutch knowledge position, the stimulus given to young researchers and the way it positions itself as a world leading institute. Thecla Bodewes, figurehead of the maritime sector, presented the award.
Bodewes: 'KIVI awards the medal of honour to MARIN. An institute with an impressive history. However, looking back is not one of MARIN's strongest suits. The institute is always full steam ahead with research for the challenges of the future. And the institute is its people. Many people in the organisation have ensured that MARIN is what it is today and it is today's people who guarantee the way forward. Today's challenges are many. The climate demands energy conservation and energy transition, society demands circularity, the economy demands innovation and young people want to play a part in all of this. MARIN has succeeded in excelling in these matters. The technical and theoretical quality of MARIN's work is world leading. MARIN is therefore a crucial cornerstone in the Netherlands' performance in the global maritime playing field.'

*Bas Buchner, managing director of MARIN, received the award from Thecla Bodewes during a small ceremony held at MARIN's inland navigation tank in Wageningen on 11 November.*

## CLINSH tests alternative fuels for inland shipping

CLean INland SHipping (CLINSH) was a five-year project in which emission reducing technologies and alternative fuels were tested in practice for the inland waterway transport (IWT) sector. This has provided valuable information about effectiveness and operating costs. The main objective was to contribute to better air quality in urban areas. This is what has been done:

- The performance of various emission reduction techniques and alternative fuels were tested on 43 ships.
- Ship emissions were monitored in real-life conditions partly before and after adjustments. Onshore measurement has also taken place in some ports and along the river Rhine.
- Measurement results have been collected in a database and used to provide tools for shipowners and local, regional, national and European governments for (new) policies on greening the fleet.
- Using shore power instead of onboard diesel generators for heating, lighting and other demands for berthed ships has reduced emissions and improved air quality in ports.

The CLINSH research has resulted in the following policy recommendations:

- CLINSH calls for investment in readily available emission reduction measures for the existing fleet that improve air quality until zero-emission technologies are mature. The social benefits of these measures calculated in CLINSH (€ 4.9 billion) are considerably larger than the investment costs (€ 1.3 billion) and the total extra costs for shipowners (€ 760 million).
- Individual shipowners find it difficult to invest due to the additional costs and expenses of utilising the new technologies. Effective policy intervention is needed through investment support and/or differentiated tax schemes that support low-emission technologies.
- The EU and member states should provide incentives for accelerated adoption of available emission reduction options through an IWT Greening Fund or grant schemes. Budget for this could be raised through the taxation of IWT fuels.
- Given the scarce capital availability in the IWT sector, it is recommended to seek permission to provide investment support of up to eighty per cent over the price difference (befitting EU state aid laws conforming to the EU taxonomy) combined with low-interest loans.
- Local regulations can help make the transition (via lower emission technologies) towards zero emissions. Aligned with financial support for engine renewal and emission reduction techniques until 2035 (Greening Fund) and ahead of a possible Stage V (or equivalent) emissions standard for the existing fleet (in 2035) could be the implementation of low-emission zones in ports. CLINSH recommends investigating the feasibility and impact of such zoning.
- Invest where air quality and/or noise concerns are most pressing and where the cost effectiveness of euros spent to reduce emissions is the highest. Developing funding mechanisms to realise operations in core locations can lead the way for a zero-emission power infrastructure by 2050.

| | $NO_x$ emission factor (g/kWh) | $NO_x$ emission relative to ccnr2 | pm emission factor (g/kWh) | pm emission relative to ccnr2 |
|---|---|---|---|---|
| ccnr0 diesel | 10.59 [c] | 205% | 0.406 [l] | 308% |
| ccnr1 diesel | 8.31 [c] | 161% | 0.132 [l] | 100% |
| ccnr2 diesel | 5.16 [c] | 100% | 0.132 [l] | 100% |
| gtl | 4.55 [c] | 88% | 0.091 [l] | 69% |
| fwe | 4.14 [c] | 80% | 0.066 [l] | 50% |
| scr-dpf ccnr1* | 2.07 [c] | 40% | 0.132 [l] | 10% |
| lng | 1.80 [l] | 35% | 0.132 [l] | 10% |
| Stage V diesel | 1.80 [l] | 35% | 0.132 [l] | 10% |
| Euro VI diesel | 0.40 [c] | 8% | 0.010 [l] | 8% |

*Emission factors derived from CLINSH measuring campaign [c] and literature [l].*

## SH2IPDRIVE wins millions from R&D fund for hydrogen-powered ships

SH2IPDRIVE (Sustainable Hydrogen Integrated Propulsion Drives), a Dutch project consortium focused on maritime hydrogen applications, has been granted a € 24.2-million subsidy of the R&D Mobility Fund (see article below) in the Netherlands. SH2IPDRIVE consists of a diverse group of 25 companies and knowledge institutions from across the maritime sector working to accelerate the introduction of hydrogen as a marine fuel. Developing the application of hydrogen is one of the pillars of the Dutch Maritime Master Plan, to which this consortium contributes extensively. The total project fund of € 34 million affords extensive research and development into multiple hydrogen applications and accelerates the move to zero-emission shipping.

The project boosts hydrogen knowledge and lays the foundation for a strong maritime hydrogen economy in the Netherlands. The results align entirely with the objectives formulated in the Dutch Maritime Master Plan, aimed at strengthening the position of the Netherlands as a world leader in sustainable shipbuilding and shipping.

The project activities cover the full scope of hydrogen R&D and are organised in nine different work packages including bunker and storage systems, hydrogen carriers, fuel cells, data collection and system validation, system integration, modular testing, ship design and safety.

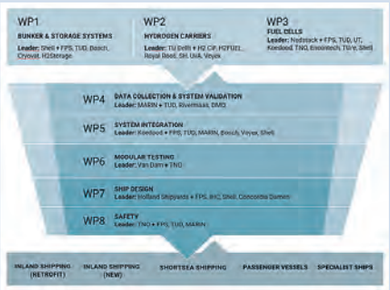
'We already know that hydrogen can be produced completely carbon-free through green electricity. With the electrochemical conversion of hydrogen in a fuel cell, power can be generated on board to drive ships fully emissions-free with no greenhouse gases, nitrogen oxides, or particulate matter being released. However, to achieve a fully zero-emission shipping sector quickly and cost-effectively, a lot more research is required in optimal techniques, applications and standardisations,' explains Marjon Castelijns, Manager Business Development of Future Proof Shipping (FPS), which coordinates the project.

The main objective of SH2IPDRIVE is the development of reliable, safe, standardised, scalable and cost-effective solutions for zero-emission propulsion and energy systems for hydrogen-based ships. It will conduct new research into the development of safe applicable technologies for hydrogen in four different forms: (1) compressed hydrogen gas and (2) liquid hydrogen, and hydrogen bound to carriers such as (3) liquid organic hydrogen carriers and (4) borohydrides.

Another main area of exploration for the team is research into new fuel cell systems with a greater power density and a longer lifespan, the use of residual heat and the scaling up of fuel cells. The team will also work on developing technical standards for bunkering and storage of hydrogen for shipping, integration of hydrogen technology on board ships and ship design. For this purpose, data collection and system validation are included in the project and the integral safety concept of these new systems is also taken into account.

Developments of technological components and subsystems are validated in five concept designs representative of different ship types that are important for the Dutch shipping sector: inland shipping new construction, inland shipping retrofit, coastal/shortsea shipping, passenger vessels and specialist ships.

The consortium of 25 parties is made up of companies, universities, knowledge institutions and the Dutch Government. Among the members are Delft University of Technology, Nedstack Fuel Cell Technology, MARIN, Holland Shipyards, TNO, Royal IHC, Concordia Damen and the Dutch Defence Materiel Organisation. SH2IPDRIVE'S total project budget is € 33.6 million, including the 24.2-million subsidy and the partners' own resources of € 9.4 million.




*The SH2IPDRIVE work packages.*

## Dutch Government invests € 52.9 million in maritime R&D

The Dutch Ministry of Economic Affairs and Climate Policy has awarded € 52.9 million from the national RDM (R&D Mobility) subsidy scheme to three maritime consortia. The scheme is intended to counteract declining investments in R&D in the maritime, automotive and aviation sectors. Through the maritime R&D projects, smart knowledge and technology is developed within the Netherlands to make shipping more sustainable. The grant is an important first step towards realising the Maritime Master Plan, a plan to become a global leader in the construction and use of smart, clean and safe ships. By 2030, the sector aims to have fifty emission-free ships in operation. With the RDM scheme, companies and research institutes can co-finance R&D in the field of sustainability and digitalisation. Of the nine maritime consortia that submitted projects, three were successful. They were awarded a grant amount of 52.9 million for the development of methanol and hydrogen as alternative energy carriers and the elimination of greenhouse gas emissions from LNG-powered ships. The high-quality proposals that did not receive an RDM subsidy may be reconsidered via the application submitted by the Dutch maritime sector for the allocation of € 365.6 million from the National Growth Fund.

The Maritime Master Plan is calculated to lead to a twenty per cent reduction in construction costs, 25 per cent more smart emission-free ships built in the Netherlands due to an improved competitive position, a five per cent increase in employment, a € 2.2 billion increase in economic earning capacity in 2040 and a 15.4-megatonne reduction in harmful emissions ($CO_2$, $NO_X$ and particulates) in 2040 with a capitalised effect of € 3.6 billion.

# WHEN THE IMO FAILS TO DELIVER, SHIPOWNERS MUST TAKE CHARGE

**We are witnessing a bitter struggle nowadays between shipowners and shippers whereby the latter are constantly confronted with sharply rising costs of maritime transport while the first are making profits almost never seen before. And yet it is very important that both enemies reconcile and work together on a more sustainable shipping sector, which may now seem like dreaming of a miracle. Yet, waiting for international politics in the framework of the IMO (International Maritime Organization of the United Nations) has no sense as was proven again by the meeting of IMO's MEPC (Marine Environment Protection Committee) from 22 to 26 November.**

The 174 member states and three associate members of the IMO failed to agree on a more ambitious pathway to bring shipping to a net-zero future on the emission of greenhouse gases (GHGs). Sure: 'In view of the urgency for all sectors to accelerate their efforts to reduce emissions as emphasised in the recent IPCC reports and the Glasgow Climate Pact, the IMO recognises the need to strengthen the ambition of the initial IMO GHG Strategy during its revision process and it has agreed to initiate the revision of its GHG strategy,' declares the IMO in a press release. But the IMO gives itself another two years for this process. A final draft for a revised IMO GHG Strategy cannot be expected before the MEPC 80, which is scheduled to meet in spring 2023.


The only matter the MEPC77 could agree on was the adoption of a resolution on the voluntary use of cleaner fuels in the Arctic to reduce black carbon emissions. In other work, the MEPC adopted a strategy to address marine plastic litter from ships; adopted revised guidelines for exhaust gas cleaning systems (EGCS) and agreed the scope of work on discharge water of EGCS; and considered matters related to the Ballast Water Management Convention. So, just all very soft promises and no thorough measures and new regulations to counter the massive and dangerous problem of climate change.

## Extremely poor outcome

Then it is fully to be understood that the shipping sector is very disappointed about this extremely poor outcome of the deliberations in the IMO framework. As it is not the IMO itself that is under siege of ever more agitative NGOs that attack the shipping industry for their emissions of GHGs and the growing contribution of sea transport to the threatening change of the climate. Especially in Europe, shipowners have to deal with an ever-growing burden of restrictions and soon will come in effect the extra levies within the framework of the EU-ETS scheme for $CO_2$ rights that will have to be paid in Europe when sailing to and from European ports.

Reacting to the failure of the MEPC to make any significant progress, the secretary general of the ICS (International Chamber of Shipping, the umbrella organisation of shipping-interest groups), Guy Platten, took an unprecedented hard line: 'A missed opportunity to decarbonise shipping at MEPC77. We are disappointed that the words and commitments made by governments at COP26 have not yet been translated into action. This week's meetings have missed the opportunity to take forward a range of GHG reduction measures, which would accelerate the development of zero-emission ships that are urgently needed at scale to decarbonise our sector. It's almost as if COP26 never happened.'

## Stop kicking the can down the road

According to Platten 'governments can't keep kicking the can down the road; every delay moves us further away from reaching pressing cli-

mate goals. We will continue to work with governments to agree to the suite of measures, which the industry has proposed, including the 5-billion-dollar R&D fund as an immediate step to be followed by a levy-based carbon price for shipping. The adoption of both these measures will be the only way to deliver on net-zero emissions from shipping by 2050 while ensuring an equitable transition that leaves no one behind.'
He adds: 'The message from the industry at COP26 was clear; time is running out and we must do everything in our power to decarbonise now. Industry will continue to press IMO to act as the importance of addressing climate change is too great to give up on. There was a clear recognition from many more countries that there is an urgent need to significantly increase R&D spending. But we are disappointed that insufficient time was dedicated to allow IMO member states to take a decision on the 5-billion-dollar fund at this session.'
'All we are asking is for governments to let business to get on and do the things that need to be done. We are not even asking for money or the type of subsidies that other sectors receive. This is a no brainer at a time when we do not have time to prevaricate. The IMO Maritime Research Fund is the only proposal on the table ready for immediate agreement. If it is not taken forward soon, we fear this will signal to the world, following COP26, that IMO is no longer truly serious about maintaining its leadership on GHG issues and that others may then move in to fill the vacuum. We will continue to work with governments to ensure that concerns are addressed so that this fund can be implemented as soon as possible,' Platten concludes.
Not that the IMO doesn't realise how important it is that the shipping sector also takes part in reducing the emission of GHGs. 'The world is watching us,' IMO secretary general Kitack Lim told the delegates attending the opening day of the MEPC77 virtual meeting. The South-Korean Lim is well aware of the fact that we cannot wait any longer to decarbonise industries wherever possible: 'COP26 is still very fresh in our minds, emphasising that we are no longer considering climate change as it will impact future generations, but with the very real and present threat to our generations.'

## After day one hope was dashed

Many countries at COP26 in Glasgow two weeks before the MEPC meeting, including major shipping nations, called for a much more ambitious policy to green shipping. This promised hope that something could be reached at the IMO. But after day one all hopes for a far stricter GHG policy for the shipping sector had been dashed. At that first day, delegates discussed the Marshall Islands' and Solomon Islands' resolution proposal for zero-emission shipping by 2050, a far stricter target than the current ambition of a fifty per cent cut of GHGs from shipping based on a baseline set in 2008. The Marshall Islands is the world's third shipping register or flag state after Panama and Liberia. But with the Solomon Islands, it is also one of the nations that has most to fear from climate change and rising sea levels that threaten to engulf most of the islands the nations of the Pacific call their home.
According to the report of Sam Chambers in his daily newsletter Splash 24/7, just eight countries supported the zero by 2050 resolution: Canada, Japan, New Zeeland, Ukraine, the UK, the US, Vanuatu and Iceland. A total of 31 countries – the EU27, Georgia, South Korea, the Bahamas and Norway – supported the 2050 zero-emission target, but not the resolution. Notably, several EU countries (Belgium, Finland, Denmark, France, Germany, Hungary and Sweden) endorsed the "Declaration on Zero Emission Shipping by 2050" at COP26, but failed to support a resolution at the MEPC 77 meeting to actually make that the goal for shipping.

## Opposition of the fossil lobby

The problem of the IMO is that new rules and regulations for global shipping based on an ambitious GHG reduction strategy, preferably as soon as possible to come to net-zero, must be agreed unanimously. And the reality is that quite some states and their leaders (such as a Putin or Bolsonaro) are still not convinced of the necessity to act against GHG emissions now and not in the far future. Again, according to Splash 24/7, several countries spoke against the 2050 resolution and the 2050 zero-emission target, including Brazil, China, Russia, Saudi Arabia, South Africa and the United Arab Emirates. Except for South Africa, these are all oil-producing countries that of course don't want to give up this lucrative business too soon.

> The problem of the IMO is that new regulations for global shipping must be agreed unanimously

After this deplorable turn of events at the IMO MEPC, it is clear that the push for decarbonising global shipping has to come from other stakeholders in the industry. First and foremost, it is of course the first responsibility of the shipowners, but also of the cargo owners (shippers). Shipowners know they can no longer invest in a ship that can only run on heavy fuel oil with a scrubber. A ship must be ready for alternative, cleaner, more sustainable fuels. In mid-November, Clarksons Research reported that the implementation of green technology in shipbuilding is growing. Uptake of alternative fuels has continued to progress steadily, with 4.2 per cent of the fleet on the water and 34.0 per cent of the orderbook in tonnage (GT) terms capable of using alternative fuels or propulsion. This includes 29.7 per cent of orderbook tonnage set to use LNG (546 units), 2.5 per cent to use LPG (95 units) and 1.8 per cent due to use other alternative fuels (about 200 units; including methanol (22), ethane (10), biofuels (2), hydrogen (3) and battery/hybrid propulsion (150)). Over 244 ships in the fleet and 95 in the orderbook are designated "LNG ready", while there are now 24 "ammonia ready" and 5 "hydrogen ready" vessels on order.

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*The Wim Wolff for NIOZ.*


*The ice-breaking walk-to-work vessel Nabil (photo F.J. Olinga).*

# KEEL LAYING

## Wim Wolff

At Dijkstra Metaalbewerking BV, Harlingen, the keel was laid for the hull of the research vessel Wim Wolff (yard number 362) on 11 November. This vessel, which will be the replacement of the Navicula (1981 – 129 GT), was ordered by NIOZ (Koninklijk Nederlands Instituut voor Onderzoek der Zee/Royal Netherlands Institute for Sea Research), Den Hoorn/Texel, with Thecla Bodewes Shipyards, Harlingen.

The technical details are: 420 GT – Loa x B x D (d) = 36.95 x 10.00 x 3.43 (1.20) metres. The air draught is 8.90 metres above a design draught of 1.00 metres. Energy is generated by two diesel generators with a sustainable diesel-electric power management system and a power pack that does not contain lithium. Delivery can be expected in 2023.

# LAUNCHINGS

## Nabil

The shallow draught ice-breaking walk-to-work vessel Nabil (yard number 862, imo 9915698) was launched at Delfzijl on 13 November. The vessel was ordered by Belvador Shipping Ltd., Yuzhno-Sakhalinskaya, on 1 June 2020 and will be managed by Mercury Sakhalin Co. Ltd. The keel was laid in the newbuilding hall of Royal Niestern Sander BV on 11 November 2020. A few days before launching, the 2150-tonne offshore support vessel was transported by Wagenborg Nedlift with eight SPMTs (self-propelled modular transporters) from the hall to the quay. The Nabil has been specially designed for year-round operations in temperatures ranging from -30 to +35°C. The vessel can break through ice up to 100 cm. The hull design was optimised for ice performance by Aker Arctic, Helsinki, with a shallow draught of 3.15 metres and a transit draught of 4.00 metres in open waters, and for a grounded bottom notation. The Nabil will also be equipped with a motion compensated gangway, the winterised Ampelmann A-Type AG25wEP, optimised for both winter and summer operations.

The details of the Nabil are: 2694 GT, 808 NT – Loa (ll) x B x D (d) = 80.17 (72.54) x 14.00 x 5.25 (3.15) metres. The diesel-electric installation consists of two Caterpillar main engines, type 3516C (170 x 215, 2x 2350 kW at 1800 rpm) and two Caterpillars, type C32 (145 x 162, 2 x 994 kW at 1800 rpm) and one Caterpillar, type C9.3 (275 kW) emergency generator set, for driving two pulling (ice milling) Steerprop thrusters, type SP 60 Pull Arc (2 x 2200 kW) with a diameter of 2400 mm, one retractable

*The Cos Master is the first of two crew tenders type Endurance 2727.*

thruster, Schottel, type SRP 260 R (810 kW) and one transverse thruster, Schottel, type STT 2 (700 kW) in a tunnel. The cargo deck area has a surface of 410 m². Accommodation is provided for fifteen crew members and 45 technicians. As a rescue class B vessel it is allowed to accommodate 150 survivors. The vessel will perform crew transfer services from the shallow Nabil Port to offshore platforms near the east coast of Sakhalin. Beyond this, the Nabil can be deployed for oil spill response services. The vessel is built under Bureau Veritas class with icebreaker 5 notation in cooperation with Wagenborg Offshore. Delivery is foreseen for mid December.

## Cos Master

At Next Generation Shipyards in Lauwersoog, the first of two offshore supply ships/crew tenders, type Endurance 2727, the Cos Master (yard number NGS-34, imo 9929405), was launched on 9 November. After trials, the vessel was handed over to Coastwise Offshore Services BV, Lauwersoog, on 10 December. The details of the Endurance 2727 are: 232 GT, 136 DWT – Loa (pp) x B x D (d) = 27.27 (23.98) x 9.80 x 4.85 (1.80) metres. The propulsion consists of two MAN main engines, type D2862 LE 489 (128 x 157), with a total output of 1066 kW at 2100 rpm, selective catalytic reduction (SCR) – Add Blue IMO Tier III/EPA Tier 4 on two Servogear controllable pitch propellers, type HD295H, for a speed of 27 knots. The Endurance is equipped with two electrically driven bow thrusters. The bunker capacity is 40 m³ for a range of 1500 nm. The Bureau Veritas classed Endurance 2727 has an aluminium hull and superstructure. The deck area has a surface of 67 m² with a maximum allowable load of 1.5 tonnes/m² or 1 x 20ft-container in longitudinal direction, 15 tonnes total weight, or 1 x 20ft-container abeam, 22 tonnes total weight, or 1 x 20ft + 1x 10ft, 10 tonnes total weight, or 1 x 10ft, 15 tonnes total weight or a maximum of 15 tonnes. Accommodation is provided for five crew and thirty passengers. The second Endurance 2727, the Cos Mate (yard number NGS-33, imo 9929417) is scheduled for delivery in June 2022. Both vessels will be managed by Seazip Offshore Service BV, Harlingen.

## Multibuster 8020 SD

Albwardy Damen Shipyard, Sharjah, launched

*The versatile Multibuster 8020 SD is directly available from stock.*

a new type of vessel, the multifunctional diesel-electric Multibuster 8020 SD (yard number 610117, imo 9905667) on 8 September. The keel laying took place on 14 January 2020. After completion in October, the Multibuster is directly available from stock. If required, the MB 8020 can be outfitted with daughter craft, an A-frame, firefighting (FiFi) 2, an anchor handling tug winch, stern rollers or a four-point mooring system. With the addition of an Ampelmann, the Multibuster can also be deployed as walk-to-work vessel, but the versatile vessel can also be used for humanitarian aid and disaster relief support. For that purpose, Damen has already prepared the vessel for refitting, with potential options such as an extra deck for a helicopter and hangar (for up to two helicopters), davits to launch rigid inflatable boat (RIBs)/interceptors and there is ample space available for containers and specific mission equipment. Additionally, the MB 8020 is suitable for both dredging and subsea mining applications.
The details of the Multibuster 8020 are: 3759 GT, 2365 DWT – Loa (pp) x B x D (d) = 80.38 (77.18) x 20.00 x 5.50 (3.50) metres. The shallow operational draught is 3.00 metres and in combination with the DP2 capabilities, the MB 8020 is suitable for a wide range of nearshore and offshore activities. The hull is strengthened for beaching, which is ideal for cable laying, and also suitable for unexploded ordnance (UXO) clearance, for the surveying phase of projects, trenching, hose handling, remotely operated vehicle (ROV) deployment and diving activities. Power is generated by four Caterpillar main engines, type C32 acert (145 x 162), 4 x 994 bkW connected to four Leroy Somer generators (4 x 940 ekW) and two Caterpillars, type C18 (145 x 183), 2 x 616 bkW connected to two Leroy Somer generators (2 x 565 ekW), for driving two Schottel fixed pitch azimuth thrusters, type SRP360FP (2 x 1400 bkW) and one retractable bow thruster, type SRP260RT-FP (1 x 800 bkW) and one thruster, type STT2 in a tunnel (1 x 765 bkW), for a speed of 11 knots and a maximum bollard pull of 60 tonnes. The bunker capacity is 646 m³ marine diesel oil (MDO). The spacious aft work deck has an unobstructed surface of 800 m² with a maximum allowable load of 10 tonnes/m² that is usable for performing tasks such as welding, as it is free from deaeration systems and filling pipes. The heave compensated HLRM deck crane, type 1000/6S, has a lifting capacity of 65 tonnes at 9.6 metres and a maximum outreach of 30 metres. The secondary crane can lift 18.9 tonnes at 4.7 metres or 6.4 tonnes at a maximum outreach of 12.6 metres. The Multibuster 8020 is equipped with a moonpool of 0.8 m². Accommodation is provided for fourteen crew members and 46 special personnel.

## BL-734505 Pax Dei II

At Casco & Sectiebouw Rotterdam (CSR), Rotterdam, the hull of the BL-734505 Pax Dei II (yard number 227, imo 9929522) was launched with the floating sheerlegs Matador 2 on 16 October. The keel laying took place on 17 De-

*Casco & Sectiebouw Rotterdam launched the Pax Dei II.*


*IHC sold the EasyDredge 2700 Bahia San Carlos from stock.*

*The ASD Tug 2811 Naghi 5.*

cember 2020. The hull was towed to Padmos Shipyard BV, Stellendam, for outfitting under Bureau Veritas class.
The details of the Pax Dei II are: 233 GT – Loa (pp) x B x D (d) = 24.95 (23.40) x 8.50 x 4.00 (3.60) metres. The propulsion plant consists of a Mitsubishi main engine, type S12R-MPTAV (170 x 180), output 680 hp or 500 kW on a fixed pitch propeller. Delivery to Armement Boulonnais S.A.S. (T. de Boer, Urk), Boulogne-sur-Mer, is scheduled for March 2022.

# DELIVERIES

### Bahia San Carlos

Royal IHC sold the 2700-m³ trailing suction hopper dredger (TSHD) Challenger 3 (yard number 1297, imo 9859727) from stock to the Mexican Secretaria de Marina. The EasyDredge 2700 was built at the Polish shipyard Neptune Shipyard/Partner Stocznia Sp.z.o.o., Szczecin, as yard number 527 and towed to Hardinxveld after the launch on 17 July 2019. From 25 to 27 October, the TSHD, renamed Bahia San Carlos, executed tests and trials at the Maasvlakte and on the North Sea. Under the flag of St.Vincent & Grenadines, the dredger departed from Kinderdijk on 12 November headed for Vera Cruz via Las Palmas, where the EasyDredge 2700 will be handed over to the owners. Earlier, the identical Mont Mandara (yard number 1296, imo 9848455, ex Challenger 2) was delivered to Port Autonome de Douala on 31 July 2020. This EasyDredge 2700 was built at the same shipyard as yard number 526 and towed to Hardinxveld after the launch on 27 February 2019. Both diesel-electric dredgers were originally ordered by P.T. Humpuss, Jakarta, but before delivery the order was cancelled and both vessels were moored at Hardinxveld for delivery from stock.
The details of the Bureau Veritas classed EasyDredge 2700 are: 2797 GT, 885 NT, 3910 DWT – Loa (pp) x B x D (d) = 81.75 (79.80) x 15.80 x 5.90 (5.50) metres, and a dredging depth of 25 metres. Diameter of the suction pipe is 700 mm. Propulsion is provided by two Caterpillar main engines (170 x 215) with an output of 2500 kW or 3396 hp at 1600 rpm, twin propeller for a speed of 11 knots. The bunker capacity is 221.7 m³.

### Naghi 4 & 5

The ASD Tugs 2811 Naghi 4 (yard number 513208, imo 9844409) and Naghi 5 (yard number 513209, imo 9844025) arrived at Hamriyah on deck of the BBC Kibo (2011 – 8255 GT) on 16 April. Both tugs were delivered ex stock by Damen Song Cam Shipyard JSC, Haiphong, to Naghi Marine Company, Jeddah. The Naghi 4 and 5 were launched on 4 July 2019 and 10 March 2020 respectively.
The details of the ASD 2811 are: 299 GT, 89 NT – Loa (pp) x B x D (d) = 28.57 (25.76) x 11.43 x 4.60 (4.65) metres. The propulsion system consists of two Caterpillar main engines, type 3512C TA HD/D (170 x 215), total output 3806 kW or 5104 hp at 1800 rpm, on two RR rudder propellers, type US 205, with a diameter of 2500 mm for a bollard pull of 62.7 tonnes and a speed of 13.1 knots. The bunker capacity is 69.4 m³. Both tugs are built under class of Lloyd's Register.

### Duchess

Damen Shipyards Hardinxveld delivered the Shoalbuster 2711 Duchess (yard number 571814, imo 9928944) from stock to Ports of


*The Shoalbuster 2711 Duchess was delivered from stock (photo H. Trommel).*


*The StanPatrol 4207 Alexander Bustamante arrived at Kingston on 5 August.*

Jersey Ltd., St. Helier, on 12 November. The hull had been launched at Safe Co. Ltd. Sp.z.o.o., Gdansk, on 30 December 2020, and was subsequently delivered in Dordrecht by the m.t. Baltsund on 4 February and added to Damen's stock. After the sale, the Shoalbuster was completed in Gorinchem under Bureau Veritas class. On 4 and 5 November, trials and tests were carried out in Rotterdam Europoort. On 11 November, the Duchess was christened in Hardinxveld by Fiona Planterose and under management of Landfall Marine Contractors BV, Ridderkerk, the Duchess departed for its first assignment on 14 November: towing the riverpax Swiss Sapphire (2007 – 110 x 11.40 m) from Le Havre to Tarcanville. The details of the Shoalbuster 2711 are: 321 GT – Loa (pp) x B x D (d) = 27.02 (23.82) x 11.63 x 4.25 (3.00) metres. Propulsion is provided by two Caterpillar main engines, type 3512C HD DITA (170 x 215), with a total output of 3546 hp or 2610 kW at 1800 rpm via two WAF773 gear boxes (7,087 : 1) on two fixed pitch Promarin propellers with a diameter of 2250 mm in Optima nozzles for a bollard pull of 41 tonnes and a speed of 11 knots. The hydraulic bow thruster has an output of 200 hp. The bunker capacity is 144 m$^3$. Accommodation is provided for seven persons. The Duchess is equipped with a Heila knuckle telescopic deck crane, type HLRM 140/6S, with a lifting capacity of 5.1 tonnes at 18.00 metres or 14.6 tonnes at 7.64 metres.

## Alexander Bustamante

After a journey of almost two months across the South Pacific and through the Panama Canal, the heavy-lift vessel BBC Congo (2010 – 12.974 GT) arrived at Kingston, Jamaica, on 5 August with the Alexander Bustamante on deck. The StanPatrol 4207 (yard number 549820, imo 9909560) had been launched on 26 January by Damen Song Cam Shipyard and was loaded in Haiphong in June 2021. On the morning of the arrival, the StanPatrol was offloaded and, with the support of smaller craft, delivered to its base nearby and officially handed over to the Jamaica Defence Force Coast Guard. The vessel was named after Alexander Bustamante (1884-1977), the first Prime Minister of Jamaica (1962-1967).
The details of the StanPatrol 4207 are: 241 GT, 72 NT – Loa x B x D (d) = 42.80 x 7.11 x 3.77 (2.52) metres. Propulsion is provided by two Caterpillar main engines, type 3512B TA-HD (170 x 215), with a total output of 5712 hp or 4200 kW at 1600 rpm via Reintjes gearboxes, type WLS 930, on two controllable pitch propellers for a top speed of 26.5 knots. The bunker capacity is 30.65 m$^3$ for a range of 2450 nautical miles at service speed or fourteen days at sea. Accommodation is provided for eighteen people. The patrol vessel is equipped with a 7.5-metre RHIB (rigid hull inflatable boat) and armed with two 12.7-mm machine guns.

## Z-39 Sophie

Padmos Shipyard BV, Stellendam, delivered the Z-39 Sophie (yard number 223, imo 9899624) to Vita Nova (Karel Ackx), Knokke-Heist, on 11 November. The hull was built by Casco & Sectiebouw Rotterdam (CSR), Rotterdam, launched on 1 April and towed to Stellendam for completion on the same day. Trials on the Haringvliet took place on 18 November.


*The Z-39 Sophie under construction at Stellendam (photo A. Neighbourfield).*

*The Phi was built by Royal Huisman, Vollenhove.*

*The support yacht Phi Phantom.*

The details of the Bureau Veritas classed Sophie are: 385 GT, 114 NT – Loa x B x D (d) = 37.95 x 8.50 x 5.40 (4.50) metres. Propulsion is provided by an ABC main engine, type 6DZC (256 x 310), with an output of 1532 hp or 1127 kW at 1000 rpm on a fixed pitch propeller.

## Phi

The superjacht Phi (yard number 403, imo 9867748) was launched at Royal Huisman Shipyard BV, Vollenhove, on 23 July. The Phi was towed to the location in Zaandam to be prepared for trials on the North Sea from 26 October to 2 November and on 16 November. The featherweight yacht has an aluminium hull and superstructure and is ABS classed. The design was prepared by Cor D. Rover, Van Oossanen Naval Architects and Lawson Robb (interior) and based on the well-known Golden Mean, where the shapes are in proportion to nature. Accommodation is provided for up to twelve guests in six cabins and eleven crew members in six cabins.
The details of the Phi are: 499 GT – Loa x B (d) = 58.50 x 9.73 (3.00) metres. Propulsion is provided by two MTU main engines, type 12V 2000 M96L (330 x 380), with an output of 2 x 1655 hp or 1234 kW, twin propeller, for a maximum speed of 22 knots.
The Phi will be supported by a shadow ship Phi Phantom (imo 9940411), which was delivered by Alia Yachts, Antalya, on 2 July 2021 and designed by Cor D. Rover Design and Van Oossanen Naval Architects.
The details of the Bureau Veritas classed Phi Phantom are: 199 GT – Loa (wl) x B (d) = 36.00 (34.50) x 8.40 (2.25) metres. It is powered by two Caterpillar main engines, type C32 (145 x 162), output of 2 x 831 kW or 1115 hp, twin propeller, for a cruising speed of 19 knots and a top speed of 21 knots. The aluminium support yacht has a bunker capacity of 57.4 $m^3$ for a range of 4200 nautical miles at cruising speed. The Phi Phantom has been built to carry a 12-metre and 14-metre tender, an 8-metre sailing boat, six Jet Skis, a car and 60,000 litres of surplus fuel for the Phi, as well as bicycles, motorbikes, spare parts and a vast amount of storage and refrigeration. The management of the two yachts has been outsourced to Decagon Yachting Ltd., Valletta.

## Shinkai

The explorer yacht Shinkai (yard number 708, imo 9904558) was launched and left Aalsmeer for Rotterdam on 2 October. The hull was built by Slob Scheepswerf BV, Papendrecht. The keel had been laid on 6 March 2019 and the yacht was launched on 28 October 2020. After this, the hull was towed to Feadship Koninklijke Scheepsbouw de Vries BV, Aalsmeer. The Shinkai, Japanese for deep sea, was designed by Vitruvius Ltd., Feadship De Voogt Naval Architects, Paul Briand Ltd. and Boutsen Design. The Shinkai is built with a steel hull and aluminium superstructure with teak decks. The yacht was towed by the motortugs Broedertrouw XV and XIV via Woubrugge, Alphen aan den Rijn to Gouda and at last to Rotterdam-Waalhaven, where the Shinkai arrived on 9 November. The next day, the yacht departed for trials on the North Sea and arrived at Amsterdam on 11 November.
The details of the Shinkai are: 974 GT, 292 NT – Loa x B (d) = 54.9 x 10.35 (2.99) metres. It is powered by two MTU main engines, type 12V 2000 M72 (330 x 380), with an output of 2 x 1468 hp at 2250 rpm, for a cruise speed of 12 knots and a maximum speed of 15 knots. The bunker capacity is 140 $m^3$ for a range at cruise speed of up to 5500 nautical miles. The Shinkai was built according to Bureau Veritas classification society rules. Accommodation is provided for ten guests in five suites and twelve crew members. The Shinkai can carry and operate a three-man submarine, a 6.3-tonne U-Boat Worx C-Explorer 3, in addition to a normal complement of tenders and toys, as well as a 4x4 Toyota Land Cruiser and an all-electric Jet Ski. The yacht is equipped with a foldable deck crane with a lifting capacity of 7.4 tonnes at an 8-metre reach.

*The explorer yacht Shinkai has a submarine on board.*

## YN 552044

The PSV 3300 E3 YN 552044 (Imo 9756298) arrived at Damen Shiprepair in Amsterdam on 6 September 2021, where the vessel will be converted into a humanitarian aid vessel to provide disaster relief and humanitarian assistance around the world. The conversion is expected to be finished in about one year for delivery to Global Support and Development, Redwood City, California. It was the first of two Platform Supply Vessels 3300 that were built by Ha Long Shipbuilding Co, Ha Lo, under supervision of Damen Shipyards. The keel for the first PSV was laid on 10 March 2015 and the launching took place on 10 May 2016. The second PSV (yard number 552045, imo 9756303) was launched on 16 August 2016. However, both vessels were not accepted by the original client and subsequently put in stock.
The details of the PSV 3300 E3 are: 3040 GT, 912 NT, 3515 DWT – Loa (pp) x B x D (d) = 80.04 (74.75) x 16.30 x 7.50 (6.20) metres. The energy


*The Aragonborg loaded with two inland tanker hulls (photo Flying Focus).*

is supplied by two Caterpillar diesel generators, type 3512C (170 x 215), each with an output of 1352 kW at 1800 rpm and two type C32 (145 x 162), each with an output of 994 kW at 1800 rpm. Propulsion is provided by two electric motors, each with an output of 1500 kW at 1200 rpm, on two Schottel azimuth thrusters with a diameter of 2400 mm, for a speed of 13.6 knots. The two bow thrusters, with a diameter of 1750 mm, have an output of 735 kW each. The bunker capacity is 300 m$^3$.

## Aragonborg

The Aragonborg (2010 – 11,885 GT) of Wagenborg Shipping BV, Delfzijl, made a voyage from China to Rotterdam via the Northern Sea Route. Two hulls of the inland tankers Castilia (yard number ZMS 18-06) and Catalonia (yard number ZMS 18-13 ), built by NSC Marine (Nantong) Corporation Ltd., were loaded on deck in Nantong on 23 September and after a month, the transport arrived safely at Rotterdam-Waalhaven. Both hulls (86 x 11.45 metres) were offloaded by the floating sheerlegs Matador 3 on 25 October and towed to Zeeland Maritime Services, Wemeldinge, for completion for account of Ceelandia Scheepvaart BV, Goes, after arrival on 24 November.


*The PSV 3300 E3 YN 552044 (photo R. Coster).*

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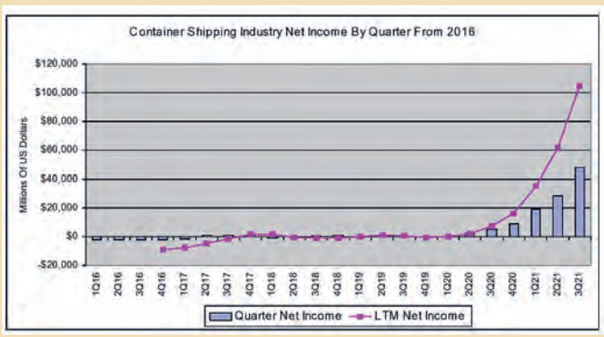
## Fishing and offshore windmills

One of the Dutch fishery organisations, EMK, has reached an agreement with the World Treasury Center about research into the impact of windmills in and around the North Sea and coastal areas. Fishermen are concerned about the harmful effects of offshore wind turbines on the marine environment. Because this is a relatively new and unknown industry on which little scientific research has been done, precaution should be the main concern. The aim of the research is to objectively establish 'whether or not wind turbines are as environmentally friendly' as is now generally being suggested. Fishermen will be deployed to record irregularities and maintenance and shipping movements around Wind Farms and will register how nature (fish and birds) reacts to the arrival of this large offshore industry. *(World Treasury Center)*

## Container liners net income

The following picture shows the development of the profits of the container industry since 2016: 'from rags to riches in a flash'. LTM net income (income during the last twelve months) of the container shipping industry amounted to well over 100 billion dollars as shown in the graph. *(Blue Alpha Capital)*




## Anchoring problems

In spite of action undertaken in 2016 by underwriters and others to improve anchor loss awareness, such incidents still increase. Due to congestion, ships are spending more time at anchorages and in areas more exposed to environmental conditions. Climate change has also resulted in longer periods of high and fast water in river approaches. According to P&I Club Gard, in most anchor claim cases, environmental risk factors, such as weather, currents, water depth and holding ground, played a significant role. One of the key issues seems to be a lack of awareness of the environmental loads for which anchoring equipment is designed. It is not designed to hold a vessel off exposed coasts in rough weather or during frequent anchoring operations in open sea. The Gard report provides further information on this subject, including useful recommendations. *(Hellenic Shipping News/Gard)*

## Shipping: Problem or solution?

Decarbonising deep sea vessels is a mighty challenge. Replacing high energy content fossil fuels by suitable alternatives, allowing long voyages with all sorts of cargo, is difficult and it is yet unknown which alternative(s) will do the trick. So, shipping is a problem as far as solving the climate crisis is concerned. But it is not the only problem in this respect. It is most unlikely that Europe for example will be self sufficient in terms of "green energy". It currently depends on the import of oil, coal and natural gas. The amount of solar and wind energy it can generate will be insufficient to replace those imports. Other areas in the world are far better placed to produce green fuels; countries with lots of sunshine and vast open windy spaces such as Australia, areas in Africa, South America and the Middle East. The solution might be to transport energy bearers like hydrogen, produced from green electricity, to Europe, Japan and the US. In some cases by pipelines, but in most cases ships will be the solution. As Hansa writes: Shipping and hydrogen need each other. So, let's look forward to large nuclear powered liquid hydrogen tankers bringing green energy to our shores. *(Hansa)*

## Dual-fuelled methanol carrier

Mitsui O.S.K. Lines (MOL) has commissioned the methanol carrier Capilano Sun, which can run on either heavy oil or low-environmental impact methanol. When running on methanol, it can reduce emissions of sulphur oxide ($SO_X$) by up to 99 per cent, particulate matter (PM) by up to 95 per cent, nitrogen oxide ($NO_X$) by up to 80 per cent and carbon dioxide ($CO_2$) by up to 15 per cent, compared to vessels using conventional oil. The Capilano Sun system uses an advanced technology that adjusts the combustion temperature by mixing water into methanol fuel and is able to meet Tier 3 $NO_X$ regulations without a scrubber. *(Hellenic Shipping News))*

## American marine atomic reactors

In the wake of COP26, US-based Southern Company and the US Department of Energy plan to demonstrate the world's first fast-spectrum salt reactor in collaboration with Terra Power and Idaho National Laboratory. The molten chloride reactor experiment is part of a five-year, $170 million cost-shared funding agreement that will provide operational data for such reactors to power next generation merchant ships. Terra and Southern are also working with Core Power from Britain. The latter has the backing of a host of owners who, combined, control more than 2000 ocean-going vessels. Other notable marine atomic developments are taking place in South Korea (Samsung), Denmark (Seaborg Technologies), Canada (NuScale), Russia (already operating ships with nuclear propulsion) and China, both for shipping and offshore installations.

# THE NORTH SEA IN TRANSITION

**The North Sea, and not just the Dutch part of it, is a well-known place to most of our readers mainly due to their shipping or oil and gas background. Yet, not so well known to the many others who live behind the ever higher dikes. An awareness is growing, however, that our overcrowded country not only needs more living space, but also space to enable our energy transition, extend our agriculture and collect building materials while proceeding with the mining of fossils, fishing and recreating and continuing to give a safe and efficient passage to a (merchant) fleet growing in size and number and potentially becoming autonomous.**

And of course all North Sea ecosystems need to be preserved, our World Heritage – the Wadden Sea – needs to be safeguarded against pollution and last but not least, human life at sea needs to be kept safe.

The North Sea does look pretty large when crossing the dunes or when travelling to the UK. However, likely not all ambitions can be realised. A very complex balancing of a multitude of interests is required. All this in a highly vulnerable, competitive, legally challenging and (inter)national safety and security context.

## The assessment framework

Prior to introducing an overview of all stakeholders in more detail and their interests within the North Sea, it is good to see what is really at stake and needs consideration. Next to the practical policies on the spatial use of the sea, a framework is required, which addresses the governing aspects of a sustainable sea to backup these policies. Look at it as an integral "formal sustainability assessment" (FSuA) framework that goes beyond a project related MER (environmental impact assessment) procedure. The latter is


*A very complex balancing of a multitude of interests is required.*


*North Sea fully allocated for various usages towards 2050 (legend and full scale available in the online version of this artice on www.swzmaritime.nl, picture from HCSS [2]).*

often not able to address the whole picture and/or has to deal with a limited (national) policy framework and missing criteria.
What should be the axes of this framework? By its nature and first of all, the sea is an ecosystem that needs conservation. A lesson we learned the hard way onshore over the past decades (already with noticeable effects on the seas) and this mistake is not to be repeated at sea. The current monitoring campaigns on the status of the ecosystems are limited in their prevention capabilities as they are looking back (monitoring) and only observe currently known relevant parameters. Ecosystems are not about biodiversity alone, but include basic physical processes like (coastal) morphology and habitat changes caused by the new users.
Next are legal issues. Using sea space and exploitation of resources seems well organised since we have our exclusive economic zone (EEZ) and other jurisdictional defined (smaller) zones. However, the current developments at sea within the wider context of the "Mare Liberum" (The Free Sea) require new international agreement and harmonisation with our immediate neighbours in the first place. Effects on almost any of the stakeholders' interests will transfer to neighbouring seas and activities. Fishing is the obvious example, free passage of merchant vessels a second important one. Last but not least are the growing importance of safety and security at sea, which potentially affect all ongoing activities and all with consequences for the ecosystem (spills), society (human life and property), (geo)politics and existing legal agreements. Within the Dutch context, already decades ago it was agreed that the risk level at the Dutch part of the continental shelf should be maintained at the same level or preferably lowered [1]. Today, against all odds, and where land- and air-based safety targets aim at zero accidents, sea-based polices still allow the introduction of new, yet unknown risks as they are coming along with new activities developing without maintaining a clear target on the acceptable total risk level at the same time. Obviously, once such a level is set, you need to proactively check the risks of planned developments against this max level. On security of the North Sea HCSS has recently published a report convincingly pointing towards a set of salient implications for the Coast Guard and the RNIN [2]. The next section discusses the interests at stake.

## Defence, shipping, fishery and recreation

Historically, these four users have the oldest rights to using the sea. With each of them also essential for respectively our national security, our wealth and regional economies. They led to early legal documents trying to establish this right of use of the seas for trading purposes (Mare Liberum [3]), now called the "Sea Lines Of Communication". Defence terminology immediately connects trading with defence. This is because of how it was actually exercised in the seventeenth century, when hardly any difference existed between trading and defence. In the first half of the eighteenth century, the principle of the freedom of the seas for navigation was commonly accepted (De Dominio Maris [4]) and at that time extended with the notion of territorial waters (3 miles).
Not much has changed since then concerning the right of free navigation. Fishing rights claims were established quite soon after the first legal proposals on the free passage of shipping appeared. Although the right of free navigation is not challenged, the practical execution is. The intense use of the North Sea by others and given the ruling laws and policies in place, free navigation is hampered.

Although the right of free navigation is not challenged, the practical execution is

Traffic flow is governed by the Rules of the Road at Sea (SOLAS [5]). These rules have a limited number of articles describing the ways to avoid collisions at sea and next to those they still rely on good seamanship. Good seamanship, however, is based on a number of assumptions. Next to experienced crew, it relies on knowing your vessel's limits and the opportunity to manoeuvre when needed, for instance to avoid unsafe wave encounters, harsh weather areas or too complex traffic situations. Spatial planning now envisages to use a larger part of the North Sea effectively limiting this exercise of good seamanship.
Along these developments, ship sizes are increasing and introduce as yet unknown safety risks. The MSC Zoe is a good example of all three issues. Would the accident have been prevented if it had timely left the TSS (traffic separation scheme) for another course?

A decision based upon experience, sufficient manoeuvring space and knowing the limits of your vessel.
The introduction of a multitude of new activities at sea adds to traffic flow intensity and often to the number of people exposed at sea, for example due to the installation and maintenance of wind parks. Ship automation and decision support or in due time autonomy would ideally increase the safety of navigation, but it does require careful introduction and a different approach to Vessel Traffic Management. At the same time, these systems need to compensate decreasing experience at sea.
It is not difficult to understand that initially, all developments above increase the risks at sea. The sheer number/size of vessels, the many objects to hit following unintended drifting, the loss of manoeuvring space, the introduction of new technologies and more people present at sea require serious mitigating measures to be put in place. These growing risks form a threat to people and property, but also to the vulnerable ecosystems in the North Sea. Legal risks could lead to claims from shipping companies if due to a lack of manoeuvring space good seamanship couldn't save the ship and the people on it. Or in the worst case, in international law disputes the way spatial planning has affected the Mare Liberum altogether.
On a smaller scale, but still highly important, the diminishing of fishing grounds directly hits the economic survivability of the people involved. If ecosystems are affected, this could further add to this threat. See also the other articles in this issue and upcoming ones. Important questions are whether the space between wind turbines can possibly be used by new forms of small-scale fishing.
It is less sure whether recreation has a right in its own sense – and is perhaps less important on the North Sea – to safe passages, preferably away from the main shipping routes. Potentially, recreational vessels could use the space between wind turbines, albeit less fun. Naval vessels, although a lot less vulnerable to the diminishing manoeuvring space, will meet some of the same effects as shipping. And certainly they still need their exercise areas. More important is the new task added to either the Coast Guard or the Navy, which concerns the protection of the new property at sea. Property that will become essential and strategically critical to our energy and perhaps food supplies. The protection of both sub-surface cables and pipes and surface critical infrastructure like transformers, floating energy islands and the renewable systems itself (tidal, fixed and floating wind) against security threats is a serious undertaking [2].


*Dredging aims mostly at collecting building materials, such as sand and gravel and uses and affects large bottom areas in the North Sea.*

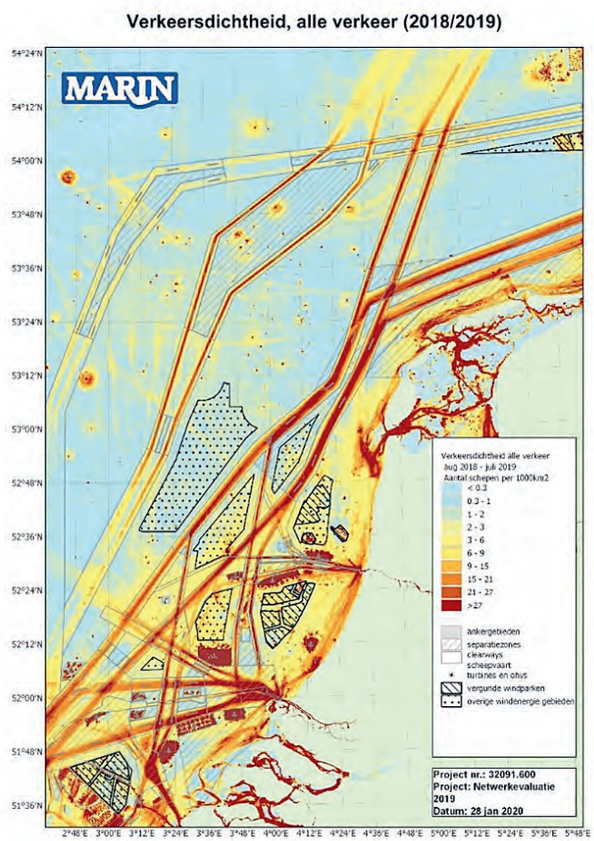
## SYSTEMATISING OF POLICY IN 1996

During the implementation of actions from the "Policy paper Shipping traffic North Sea" (BSN), the qualitative character of the document was increasingly experienced as a handicap. Partly because the policy, as a result of incidents elsewhere, came under political and social pressure, the need for a more systematic and methodical approach to the policy grew. The underlying idea was twofold. On the one hand, the effects of the existing policy could be better measured and evaluated, and on the other hand, the newly proposed measures could be better assessed on their merits (such as cost-effectiveness). **As a result, policy development can have a more "proactive" and less "incident-driven" character.** *From [1].*

### Renewables, resources and space@sea

There is no discussion that the largest North Sea spatial claims come from the need for renewables. Either fixed or floating wind, floating solar or tidal has to be installed to fulfil renewable energy requirements. Today, plans exist for about 11 GW, see added map. What is needed to fulfil our own total energy consumption is around 150-200 GW! Roughly fifteen times the current area and an enormous spatial claim. A more than challenging task with potentially (too) much impact on safety, ecosystems, security and legal. If solar and tidal can contribute using the same area, this claim can be lowered, but not necessarily with less impact on the ecosystems.
The installation and maintenance of wind farms and eventually floating solar and tidal arrays introduce a serious amount of extra shipping traffic involving many people and will result in a huge permanent spatial claim. Next to the parks, transformer platforms and cables are needed and in due time perhaps energy conversion platforms. Shipping including fishery is forbidden and thus it takes away a substantial part of their "manoeuvring" space. Estimations on how

much space is needed to reach the 200 GW installed power denote a minimum of 40,000 km$^2$ just for the wind turbines. The total Dutch part of the North Sea is 58,000 km$^2$.
Potentially, floating solar and tidal could add to the energy production perhaps by using the areas in between the turbines. Their introduction is likely as they strongly improve the persistency of the energy supply.
Oil and gas is not gone yet and will be around for at least another twenty years. 139 platforms or subsea installations (source: OSPAR) are still around on the Dutch part of the North Sea with their accompanying local or export long distance pipelines. All in all, about 1500 constructions are still standing either above or below the surface of the North Sea. Potentially, the existing wells do not go at all and are used in the future for storage of $CO_2$ or hydrogen.
In terms of resources, dredging aims mostly at collecting building materials, such as sand and gravel and uses and affects large bottom areas in the North Sea (see map).
Aquafarming is already a well-known activity, for instance in Norway, and concerns both open ocean and sheltered water fish farming. Future activities could include seaweed and other sea grown resources. Apart from occupying space, aquafarming has the potential to affect the environment by either adding nutrients into the seawater or through the unwanted escape of biomaterial.
The above renewable activities at sea necessitate the availability of liveable space at sea. Either in the form of floating structures (islands, FPSOs or semi-subs) or fixed platforms, artificial islands or even using the larger wind turbines themselves as production facilities (for example of hydrogen). Once the larger islands (large scale improves the viability) are in place, likely other users at sea will find advantages of sharing these facilities. Think of manufacturing e-fuels, port facilities for shipping and bunkering of these new (dangerous) fuels and installing maintenance hubs. If aquafarming comes to life, the islands could serve as hubs as well for collecting and processing these resources.
Against the background of rising sea levels, future port extensions like Maasvlakte III could be based upon floating or fixed infrastructure as well and perhaps combined with shore protection measures.




*Traffic density on the North Sea.*

## Ecosystems, shipping and safety at risk

Although ecosystems were discussed as part of the (sustainability) assessment framework, they do not form a group of clearly identified stakeholders or users. It could be said that all of us are stakeholders in conserving nature, safeguarding a sustainable future.
The threat to the ecosystems can hardly be overestimated given all the mentioned activities and their potential impact.
The development of shipping related risk levels potentially suffers from the same threat. The increase in activities requires a "systematic and methodical" approach of safety modelling (text box) and significant mitigating measures to maintain the current risk level.
The legal consequences of the increasing activities are to be faced and talks initiated to explore these consequences with neighbouring North Sea countries. Security awareness seems to be growing [2].

## REFERENCES

[1] From "Voortgangsnota Scheepvaartverkeer Noordzee 1996" p3: 'Wel moet worden vastgesteld dat alleen door een diepgaand onderzoek en systematische evaluatie nadere beleidsmatige aanknopingspunten kunnen worden gevonden die een bijdrage zouden kunnen leveren aan de verdere reductie van ongevalskansen en hun potentiële effecten.'
[2] The High Value of the North Sea, The Hague Centre for Strategic Studies, 2021.
[3] Hugo Grotius, Mare Liberum,1609.
[4] Cornelis van Bijnkershoek, 1702.
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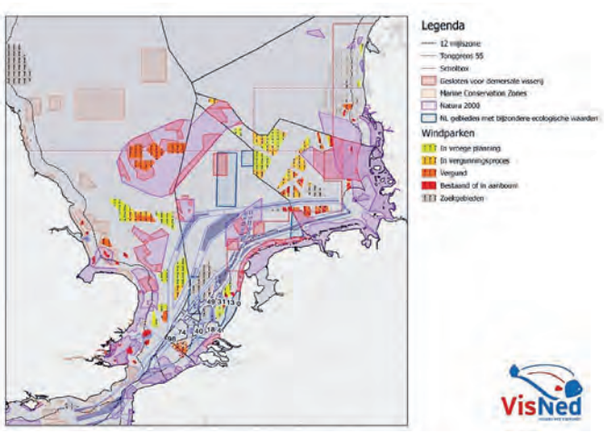
# MARINE SPATIAL PLANNING FROM A FISHERIES PERSPECTIVE

## Food, energy and biodiversity: Changing circumstances and a new balance

**When visiting a museum, admiring pictures or atlases from 300 years ago, we look at usage of the North Sea that was pretty straightforward: nature, trading, fishing and war about fishing and trading. How complex the situation is in this third decade of the 21st century and how much more complex will developments be in the decades to come, especially when humanity faces the huge challenges of feeding an ever growing population and tackling climate change.**

Fishermen have always supplied sustainable proteins for a growing population in the ages past as well as in the present day and will do so in the future. Wild caught fish provide animal proteins for a healthy diet while having a much lower environmental impact than its competitors beef and chicken and even some aquaculture products.

Fisheries are an important economic activity in rural areas, which have very few alternative means of economic development. From a macroeconomic perspective, the fishing industry delivers a small contribution to the EU GDP, but from a local and regional socio economic perspective, fisheries are essential in regional economies that depend on fishing. In addition, fishing companies are small enterprises, family owned and with limited capabilities of influencing the political debate, unless they join forces. But joining forces is not a forte of this industry, on the contrary, it is almost a textbook example of differences of opinion. The individualistic approach of fishermen shows both individual strength and collective weakness. Unfortunately, the most recent developments in the Dutch fishing industry are evidence of this conclusion.




*Where to fish in this jigsaw of spatial claims in the North Sea?*

This individualistic approach is replicated by member states. The last battle on the Doggerbank was fought between the Dutch and English in 1781. Both Dutch Admiral Zoutman and English Admiral Parker claimed the victory. In fact, the British won because they crippled Dutch trade for years to come. In 2021, another Doggerbank war is unfolding in the aftermath of Brexit. A balanced plan to protect specific habitats by limiting fishing activities was being developed when the UK was still a member of the EU. Now, within a year of leaving, the UK has unfolded a blunt plan for a full closure of the UK part of the Doggerbank, disabling fishing activities for Danish, Dutch and German vessels. A blunt plan with no domestic political hardship for the Brits, as there is hardly any UK fishing activity in the area and they can claim a much greener policy after Brexit. A win-win for the Brits and a lose-lose for the neighboring EU states. A populist green win for the Brits at the expense of EU fishers, their families and their communities.

This Doggerbank example makes it crystal clear that spatial planning at sea cannot be dealt with nationally. Independent sovereign states cannot deal with issues of common interest in a common sea, as the North, Baltic, Mediterranean or the Black Sea. But EU procedures, same as those in OSPAR (Western EU and British and Norwegian waters) or HELCOM (Baltic) Conventions, are in this day and age not fit for marine spatial planning (MSP) purpose. They take far too long and cannot keep pace with developments in need of space, which are speeding up. A revision of approach and procedures is needed right now.

For Dutch fisheries, the re-building of the country after World War II came with the development of beam trawling for flatfish. This meant an intensified use of the North Sea on the Dutch continental shelf, in UK and German and later also Danish waters. In these waters, an abundance of plaice and sole was to be caught. The North Sea was extremely productive, not in the least because of eutrophication

from the rivers Rhine and Elbe, as well as rivers with its estuaries on the east coast of England.
In this post World War II era, Dutch fishermen explored the richness of the North Sea cherished in full freedom remembering the message from the Dutch great scholar from the seventeenth century, Hugo Grotius, who presented his book "Mare Liberum", on the Freedom of the Seas. Since this book was published, very little in the field of spatial use has changed: nature, fishing and trading, but luckily no more fighting since May 1945, although an enormous amount of explosives had been left in the sea, killing fishermen until the nineties of the twentieth century.

## Exploration of the seas expanding

The first large scale "intruder" into the "free sea" for the fishermen came in the 1970s when exploration for oil and gas commenced. But very little did fishers complain, as the exploration phase was limited in time and space and production units were small with a safety zone of only 500 metres. After some discussions, peaceful co-existence arrangements were made regarding fisheries, pipelines and telephone cables.
The situation became worrisome when the other usage of the sea accumulated and IMO decided on an increased number of safe shipping lanes because of intensified commercial traffic with ever bigger ships. The European Union decided on Natura 2000 and the legal obligation of member states to protect the seabed. In addition, the EU developed a Marine Strategy Framework Directive (MSFD) to pursue a (initially non-defined) Good Environmental Status. This MSFD mentioned 'seabed integrity' as one of the indicators for this Good Environmental Status. At the same time, eutrophication reduced, the productivity of the sea reduced (less food for more fish) and the sustainability bar in the EU Common Fisheries Policy was raised, leading to reduced fishing opportunities. The sea was no longer free and societal groups claimed that the sea was a common good, disputing the unconditional use and exploitation of its natural richness by fishermen.
When all this culminated in reduced fishing opportunities because of reduced quota and reduced fishing areas, large scale wind farm development started. Without proper planning and without an integral North Sea spatial plan.

## Maritime spatial planning needed

There was an accumulation of problems and difficulties that needed an answer from an industry that was not prepared to deal with such huge issues. The oil and gas companies and wind farm developers employed MSP (marine spatial planning) specialists and the government institutionalised dedicated departments of even Ministries to deal with the matter, such as the UK Department for Energy and Climate Change. And the individual fishermen were not even aware of what was happening.
The policy advisers within the fisheries organisations became more and more aware of the situation. They informed their boards that MSP was increasingly becoming a prominent dossier, as prominent as the usual dealing with the size of fish stocks and quota. But MSP is a slow-mover, like a bulldozer. Therefore, especially for the board members of fisheries organisations, it was out of sight for too long, behind the horizon and therefore no sufficient budget or attention was designated to this issue.


*The TX 33 from 1987. Built as a true multi-purpose cutter, suitable for beam trawling, bottom trawling and pelagic fishing.*

In addition to the reduced visibility of MSP on the fisheries' radar, there was no direct link between MSP and the day-to-day operations of the families and companies that the board members represented. In reality, the fishing industry had no real answer to the questions posed by MSP.
On top of all this came the most recent additions to the Christmas Tree of EU environmental policies: the EU Biodiversity strategy and the EU Green Deal, including the suggestion to stop bottom trawling.

> Spatial planning at sea cannot be dealt with nationally

Fishing is a nomadic exercise. Fish move and fishermen follow them, trying to predict their path in order to catch them. But this path is unpredictable and changes constantly under the influence of wind, currents and seasonality. And paths differ year on year. As a result, fishers need a large searching area finding the fish in different locations from year to year. They therefore claim the entire sea as their dedicated fishing area.
This large area claim posed a limited problem until the large areas claims from nature conservation and wind farms arose. Then, nature conservation and wind farm activities would render large areas useless for the activities of the current fishing fleet, with different *métiers* of bottom trawling.
Finding a solution to this Gordian knot of interests is not an easy undertaking. But a solution must be found, as the expansion of wind farms is unavoidable and the importance of Marine Protected Areas as a means of nature conservation is beyond political doubt.

## Seeking solutions within a complex political environment

In order to find solutions, the Dutch Government looked for a very


*Exclusive Economic Zones (EEZs) in the North Sea.*

Dutch solution to find an agreement. A stakeholder process was initiated engaging oil and gas, wind, nature conservation, fisheries and ports and shipping to find common ground. To facilitate this process, the team of policy advisers to the fishing industry drafted a "vision document" called "Fisheries in a North Sea full of wind farms" [1]. The basic mantra of the document was: 'A fishing fleet with new characteristics and adapted capacity must be developed, enabling fishing communities to provide healthy seafood and thrive economically.'

This paper and its premises were well received, but the financial translation of the plans presented failed. In the meantime, use of the biggest innovation towards low impact fishing for sole and other flatfish, the so-called pulse gear, was banned by the EU. These two elements led to disillusion within the ranks of the industry, which ultimately developed into discord. On the one hand, fishing communities wanted to continue the joint facts and solution finding process, whilst others were of the opinion that the only way results could be realised was by turning their backs on these processes. So one group wanted to deal with the issues and the other (larger) group wanted to wait until the issue would deal with them and respond afterwards. Only history will learn what is or was the right approach.

> As maritime spatial planning is a slow-mover, it was out of sight for too long

My personal opinion is based on the observation of changing attitudes and political preference during twelve years of national and European lobbying. The Brexit process being exemplary. The fishing issue had been presented by Brexiteers as "the litmus test for success" and for EU fishing it seemed an issue with its importance out of sync with its macroeconomic impact. But in the end, despite the rhetoric and promises, both UK and EU negotiators dealt with their fishermen (and their families and communities) as bargaining chips. They were no more than cells in a negotiation spreadsheet, with the fishers both on the EU and the UK side as losers in a political game.

Therefore, in my opinion, the best result the fishing industry can realise, both in national as well as in international MSP processes, will be jointly, in coalitions with others. Sometimes coalitions with the energy providers, and in other circumstances in coalitions with conservationists. But best in a broad coalition of stakeholders aiming at sustainable use of the sea. In such coalitions, the fishing representatives should keep repeating their clear objective: securing the supply of sustainably caught fresh fish for a growing population enabling flourishing fishing communities. Looking ahead pays off, history has learned.

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# AIS DATA ANALYSED

## Creating a future-proof waterway network

**In the Green Deal, the European Union (EU) has set the ambition to shift a fair share of transport from the road to waterborne, while at the same time reducing emissions. A TU Delft PhD project aims at providing a better insight into how the Dutch inland waterway system functions now, and what the consequences of interventions are: Will the proposed measures achieve the set goals and ambitions, and at which trade-offs?**

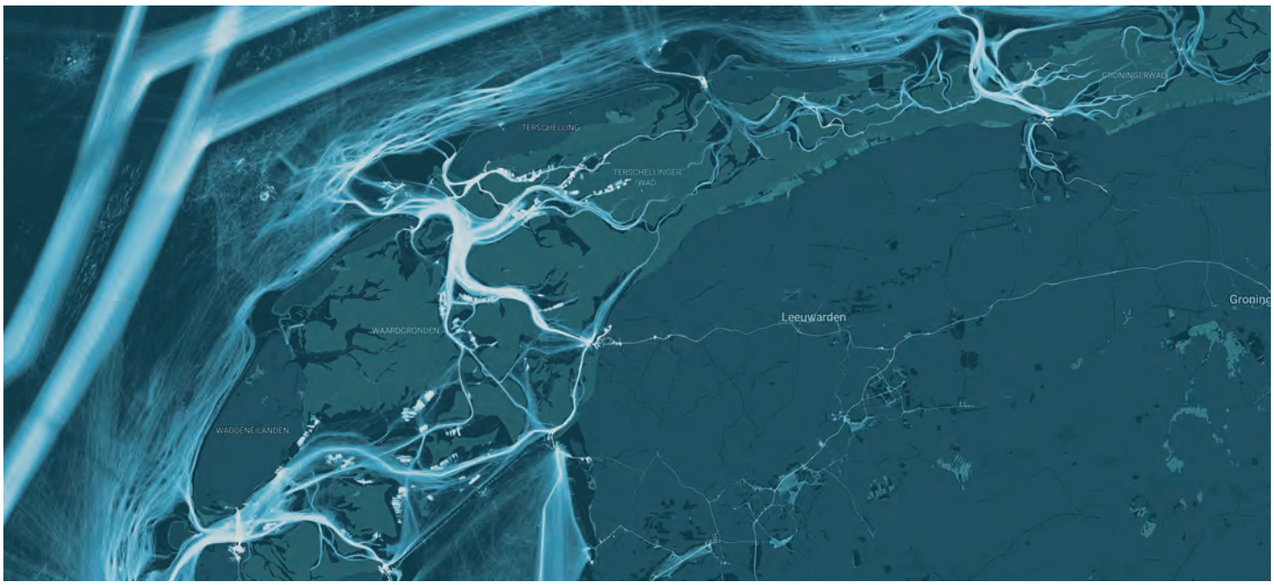
The end goal is to reach emission-free inland shipping in 2050, and intermediate milestones for emission reductions have been set (European Commission, 2019). The conditions under which transport on inland waters takes place are expected to change as well over the coming period. Increased water discharge variations are foreseen, resulting in more extreme high and low water levels on the rivers (Sperna Weiland, et al., 2015). Adaptations of the waterborne transport system, including both the infrastructure network and the fleet that is using it, are required to anticipate these future scenarios, which arise from the combination of environmental changes and expressed ambitions.

Choices will need to be made about which measures to take to adapt the system. Governments can decide to change regulations, shipowners can make modifications to their vessels or entire fleet, and cargo owners can decide to use a different modality. Each decision to intervene will have consequences for the cost of cargo transport, throughput time, capacity of the system, and total emissions – the performance of the system. Ideally, we can assess the consequences of these interventions upfront, because knowing this for a range of potential interventions allows comparison, and gives an indication of what the best option is.

For the investigation of the performance of the waterway system as part of the PhD project, information is required about the network (the "wet" infrastructure) and the vessels operating on it. First, the information about the network is obtained by combining maps of the fairways with other sources of data, such as bathymetry and current data. Second, the vessels, and how they operate on the network, can be analysed by use of Automatic Identification System (AIS) data.

### Investigating vessel behaviour with AIS data

The AIS was introduced with the aim of improving safety at sea. The position, velocity and course of vessels are transmitted multiple




*At the Waddenzee, the pattern sailed by the ships is clearly dominated by the bathymetry of this area; the ships follow the channels with sufficient water depth. This can be seen when visualising the AIS data on top of a layer with the bathymetry.*


*Individual locks can be analysed, such as the Krammersluizen. Here, the colour indicates the sailing speed instead of the intensity.*

times per minute. Other vessels and vessel traffic services receive this information, and can act upon it. When collecting and storing this data, it can be used for research purposes, for example to investigate shipping behaviour. For this project, Rijkswaterstaat shared a collected AIS data set with the TU Delft in light of a cooperation agreement. This data has been anonymised by Rijkswaterstaat before sharing it, so that the identities of individual ships and shipowners are not traceable. The data covers much of the Dutch waters, including a part of the North Sea, and it spans four months of the year 2019.

To demonstrate the possibilities for analysing the AIS data, visualisations were made. Previously, these visualisations have also been made for this type of data at this scale, however, the extremely large amount of data limited the resolution: one pixel represented hundreds of metres. The Planetary Computer, a new computing facility provided by Microsoft to promote global sustainability, offered a solution to this. With this facility, it was possible to visualise the four billion data points with a resolution of one pixel representing a couple of metres. As a result, a map was generated for the Netherlands with a great level of detail, offering the opportunity to identify individual nautical processes.

When visualising the intensity of the traffic, the vessel tracks are plotted against a dark background. The more vessels cross the same area, the brighter the colour becomes. In this way, it can be seen that out at sea, the traffic concentrates at the main traffic lanes. Further, the anchorage areas can be identified near Rotterdam, on the south side of the main entrance to the Nieuwe Waterweg. They appear as a grid of points where the vessels moor until they can enter the Port of Rotterdam. Other anchorage areas can be seen north of Scheveningen and west of IJmuiden.

At the IJsselmeer, there is a pattern in that the vessels almost sail in straight lines from lock to lock, from Amsterdam to Lelystad to Lemmer or the Ketelmeer, from Enkhuizen to Kornwerderzand or Den Oever. Individual locks can be analysed as well, for example to investigate how to increase the efficiency and reduce waiting times. An example is shown for the Krammersluizen above, where the colour indicates the sailing speed instead of the intensity. The pleasure craft locks are situated in the north and the commercial vessels use the locks in the south. This way of visualising shows vessels arriving at full speed and slowing down near the locks.

Visualising the intensity combined with vessel speed can reveal further insights into vessel behaviour, which is shown for the IJmuiden area. The colour indicates vessel speed and the brightness indicates intensity. In the intensity map, the individual wind turbines of the three wind parks near IJmuiden can already be distinguished. Adding a colour for the vessel speed also shows the workboats that sail between the turbines and the shore at high speed. While working near the turbines, their speed is very low, resulting in the blue colour. This also shows for the two anchorage areas, where the moored vessels appear as small blue clouds in the figure. Furthermore, the pattern of a dredger can be recognised in the top of the figure. It consists of an area of slow sailing to take on sand at sea, a fast run towards the beach, another area of slow sailing to deposit the sand, and another fast run back to sea.

In addition to the visualisations, AIS data is used for specific analyses of vessel behaviour. This can have the aim to reduce lead times at locks, as mentioned before. Further, knowledge can be gained on waiting and (un)loading processes in ports, which can be used to increase efficiency and to optimise the traffic flow. Origin-destination matrices based on AIS data reveal the traffic flow on the network at a large scale. Although these examples provide good insight into traffic behaviour, an even better understanding of the shipping processes can be gained when combining AIS data with other sources of information, for example when estimating emissions.

## Combining AIS with fairway characteristics

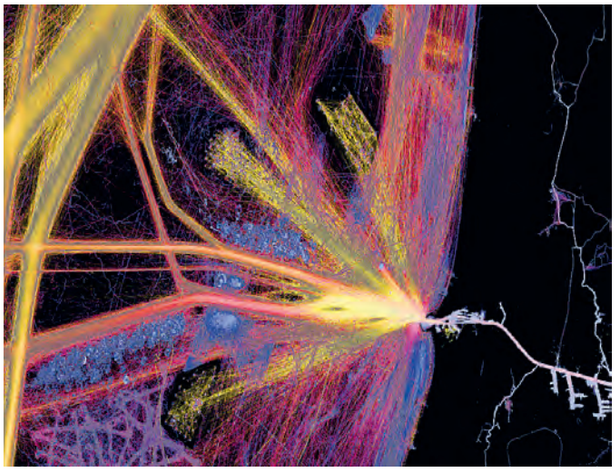
As the research project focuses on inland waterways, it offers the opportunity to link vessel trajectories from the AIS to the corresponding fairway conditions. A digital map of the fairway is used for this, which consists of a number of nodes, connected to each other through edges. The edges represent the actual fairway segments; they have a length corresponding to the actual length of that fairway section. The collection of nodes and edges is called a graph. Besides a length, the edges also have other properties, for example a water depth, which is derived from the bathymetry data at each particular fairway segment. To make the connection between AIS data and the digital map, the individual vessel trajectories are projected onto the map. For each data point in the AIS track, the closest edge in the digital map is determined. Subsequently, it is possible to construct the path of the vessel that follows the nodes and edges in the digital map.

There are two advantages of expressing the AIS vessel tracks in terms of a route along the nodes and edges of the digital map. First, an aggregated picture can be made of the vessel flow, because we can simply count the number of vessels that cross a particular fairway segment as part of their trip. As a result, instead of qualitatively assessing the intensity based on the visualised colour brightness, the number of vessels on the network can be quantified. Second, the network of nodes and edges functions as an information exchange, so that the instantaneous vessel position can be linked to other information, for example water depth or current speed at that location, which is essential when estimating the shipping emissions on the network. The reason for this is that the emissions of each individual vessel are determined based on its resistance through the water. Besides vessel dimensions, the depth of the fairway plays an important role in determining the resistance. Furthermore, to derive the speed through the water, the vessel speed from the AIS data needs to be corrected with the water current speed.

It was possible to visualise four billion data points with a resolution of one pixel for a couple of metres

## Zooming in and out

Like the traffic intensity, the emissions of the fleet can also be quantified for each fairway segment in the network. In this way, similar to indicating on the map which fairway segments are busiest, it can be used to indicate the fairway segments with the largest contributions to the total emissions. Such a map provides an overall picture of locations with the highest emissions. However, to further investigate the root cause of these emissions, we would need to be able to zoom in to these areas and the underlying processes. This is actually possible, because the emissions are calculated following a "bottom-up" approach; the calculation is made at the most detailed level, being the individual ship, and subsequently the outcomes are aggregated to form the overall, zoomed-out picture. By zooming in, it will be possible to evaluate, for example, whether most of the contributions are caused by vessels sailing at full speed, or by vessels sailing very slowly, because they are waiting for locks or bridges.



*The IJmuiden area: The colour indicates vessel speed and the brightness indicates intensity.*

Knowing the largest emission-contributing processes, better direction can be given to the potential emission-reduction solutions that should be investigated further: Is it more promising to renew relatively old vessel engines, or to make an effort to avoid vessels slow steaming or waiting near locks? Once these potential solutions are formulated, they should be assessed for their effectiveness to reduce emissions, but also for their potential trade-offs in the performance of the network, for example costs, capacity and throughput times. To do this, the consequences of the anticipated changes need to be evaluated, and that requires a model of the system. Simulations will be used to closely mimic system performance in reality, using AIS data as an important source of information. Once the current system behaviour is well replicated by the model, changes can be imposed that reflect the anticipated solutions to reduce emissions, and simulations can be run again. In such a way, the effectiveness of the proposed solutions can be assessed, and potential trade-offs can be identified, for example, at what cost do these emission-reduction solutions come?

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# NAAR EEN DIGITALISERING VAN DE NOORDZEE

**Het is passen en meten op het Nederlandse deel van de Noordzee. Er lopen belangrijke scheepvaartroutes en er liggen unieke natuurgebieden. Er wordt gevist, zand gewonnen en naar olie en gas geboord. Er vinden militaire oefeningen plaats en er wordt gerecreëerd. Onder water liggen pijpleidingen en kabels en voor de kust verschijnen steeds meer windparken. Om alle activiteiten op de Noordzee te coördineren en nieuwe gebruikers en functies in te passen, is betrouwbare data nodig, die ons van de broodnodige informatie voorziet: IV op Zee, de rode draad door alle belangen, waarbij IV staat voor informatievoorziening.**

Of het nu gaat om scheepvaartveiligheid, ruimtelijke ordening, energietransitie, visserij, wetenschappelijk onderzoek of defensie, alle belangen op de Noordzee, publiek of privaat, zijn verbonden door een rode draad, namelijk de behoefte aan informatie om die belangen optimaal te dienen. Informatie over de bodem, onder water, op en boven water is cruciaal om ons enerzijds tegen het water te beschermen en anderzijds om de Noordzee veilig, bereikbaar en leefbaar te houden. De keten van de aanleg van infrastructuur en connectiviteit die het inwinnen van de data middels sensoren mogelijk maakt tot het bewerken van die data tot bruikbare en betrouwbare informatie, noemen we IV op Zee. Het is de basis voor alle sessies over, plannen voor en werkzaamheden op de Noordzee en verdient een prominente plek op de agenda.

## Logische partner

Om kosten te beheersen en kennis en ervaring op te bouwen is het aan te bevelen dat één centrale partij de sensoren inkoopt of in ontvangst neemt, test, plaatst, exploiteert en beheert en de data meervoudig distribueert. Rijkswaterstaat is hiervoor als beheerder van de Noordzee en als verantwoordelijke voor de infrastructuur van Nederland een logische partner. We hebben goed zicht op hoe Nederland erbij ligt, verzamelen en delen in dat kader dagelijks grote hoeveelheden data en kunnen de informatievoorziening op zee goed aansluiten op bestaande datanetwerken en -verbindingen aan land. Onze focus om een partner voor andere organisaties te zijn, in combinatie met onze lange traditie op het gebied van publiek-private samenwerking, maakt Rijkswaterstaat bij uitstek geschikt om de huidige en toekomstige gebruikers van de informatievoorziening op de Noordzee te ondersteunen en ontzorgen.

## Samenwerken en expertise delen

Op de Noordzeedagen hebben we een aantal voorbeeldprojecten en thema's gepresenteerd waarin we de samenwerking zoeken en onze ervaring en expertise willen delen. Het project Maritieme Informatievoorziening Servicepunt (MIVSP) realiseert, exploiteert en

*Foto: het Offshore Expertise Centrum in Stellendam is het test- en beheercentrum van MIVSP (project Maritiem Informatievoorziening Servicepunt) en onderdeel van RWS.*

beheert de fysieke en digitale infrastructuur die nodig is om data in en om de windparken op de Noordzee te verzamelen en verspreiden. Om de invloed van nieuwe windmolens op zeezoogdieren, vissen, vleermuizen en vogels te beperken, worden ecologische data verzameld middels vogelradars en *batdetectors*. In samenwerking met het KNMI verzorgt Rijkswaterstaat (RWS) het inwinnen, verwerken en distribueren van data op het gebied van hydrologie en meteorologie. Deze data worden onder meer gebruikt voor de hoogwaterbescherming van Nederland en het veilig laten verlopen van lucht- en scheepvaartbewegingen rondom de drukke Noordzee. Door de komst van de windparken op zee worden deze data ook steeds belangrijker voor het monitoren en beschermen van de flora en fauna. In dit kader besteden we extra aandacht aan de windlidar, die de windsnelheid en -richting tot bijna 300 meter hoogte boven zeeniveau meet. Met de hoge onderhoudskosten van alle sensoren offshore is *smart maintenance* en *remote monitoring* cruciaal om de sensoren operationeel te houden en kosten te reduceren. Hierin wordt ook het gebruik van *augmented reality* onderzocht. Het Offshore Expertise Centrum (OEC) in Stellendam fungeert niet alleen als test- en beheercentrum voor MIVSP, maar ook als knooppunt voor samenwerking en opleiding in IV-expertise op de Noordzee. Naast het offshore-programma, is het RWS 3B Bouwblok, dat in eerste instantie is ontwikkeld voor binnenlands gebruik, ook toepasbaar op de Noordzee. Gebruik hiervan zorgt voor minder storingen, voorspelbaar onderhoud en grotere betrouwbaarheid van de objecten. Met het oog op milieu, ecologie, bereikbaarheid en veiligheid werkt Rijkswaterstaat samen met de Dienst der Hydrografie en de Rijksdienst voor het Cultureel Erfgoed aan een centrale opslag van een dataset van objecten op de waterbodem. RWS heeft onder beheer van de Rijksrederij circa 120 schepen ten behoeve van verkeers- en watermanagementtaken en beheer en onderhoud. Met het project ICT op Schepen (ICToS) zet RWS dagelijks in op het efficiënt en effectief gebruik van de IV en de ICT aan boord van zijn eigen schepen.

Verder werkt Rijkswaterstaat door inwinning en verwerking van radarbeelden verrijkt met AIS-data aan het presenteren van één nautisch verkeersbeeld aan de Kustwacht. Dit betreft dan vooral de dynamische data, operationeel van groot belang. Ook participeert RWS in het Digishape-initiatief "Risico gestuurd Scheepvaart Verkeersmanagement Noordzee" ter verbetering van de *situational awareness* op de Noordzee en de toegangsgeulen tot de havens. Dit initiatief wordt (deels) gesponsord door MOSWOZ, het Monitorings- en Onderzoeksprogramma Scheepvaartveiligheid Wind op Zee, dat in 2021 is gestart om op een aantal thema's kennisleemtes op te vullen en informatie te verzamelen voor beleid.

## Connectiviteit

Op de Noordzee is connectiviteit geen vanzelfsprekendheid. Het


*Transformerplatform BSA in het Borssele offshore windpark.*

Fieldlab Connectiviteit North Sea (CFNS) onderzoekt samen met opdrachtgevers, private partijen en kennis- en opleidingsinstituten welke technieken ingezet kunnen worden. Overal op de Noordzee mobiele datacommunicatie is het uiteindelijke doel. Met de ontmanteling van olie- en gasplatforms verdwijnen steeds meer locaties om onderdelen van de benodigde infrastructuur te realiseren. Middels het initiatief Digitale Noordzee wil RWS samen met overheden, bedrijven en kennis- en onderzoeksinstellingen uit de negen Noordzeelanden een toonaangevende fysieke, digitale en kennisinfrastructuur realiseren waarmee informatie over de Noordzee en alles wat daar gebeurt zo breed mogelijk is te ontsluiten. Het ultieme doel is een Digitale Noordzee, waar onderling verbonden gebruikers samenwerken en innoveren om het potentieel van de Noordzee duurzaam te benutten en nieuwe waarde toe te voegen.

## Een internationale inspanning

Bouwen aan de infrastructuur voor de Digitale Noordzee is per definitie een internationale inspanning: de Noordzee wordt grensoverschrijdend gebruikt, ontwikkelingen houden zich niet aan buitengrenzen en veel beleid wordt op Europees niveau bepaald. Bovendien kan informatie nooit vrijuit stromen zonder technische afstemming en gebruik van gezamenlijke standaarden. Internationale verbindingen vragen om internationale verbondenheid. We moeten er als landen dus samen voor zorgen dat de Digitale Noordzee in onze individuele toekomstplannen past.

> De weg van digitalisering is noodzakelijk om de Nederlandse duurzame blauwe economie te laten groeien

Op strategisch adviseursniveau wordt een gezamenlijke aanpak van de digitalisering van de Noordzee breed gesteund om de informatiebehoefte op zee nu en in de toekomst veilig te stellen. Dit gebeurt vanuit de publieke sector (de ministeries van Infrastructuur en Waterstaat, Economische Zaken, Landbouw, Natuur en Voedselkwaliteit, Economische Zaken, Defensie, Buitenlandse Zaken, Binnenlandse Zaken en Koninkrijksrelaties, Financiën, Justitie en Veiligheid en Onderwijs, Cultuur en Wetenschap en Kustwacht Nederland), door (het publieke deel van) de havenbedrijven (Rotterdam. Amsterdam, Eemshaven, Zeeland Seaports, Antwerpen) en ook door onderzoeksinstituten (MARIN, TNO, Deltares, WMR, TU Delft, NIOZ). Daarbij is het besef dat er tijdig actie moet worden genomen om de digitale transformatie van de Noordzee in gang te zetten een zwaarwegende verbindende factor. Het gaat immers vele jaren duren om die benodigde infrastructuur – zoals antennes, sensoren, meetboeien, meetopstellingen, kabels, zenders en ontvangers en de verbindende netwerken daartussen – neer te zetten.

## Werkgroep Digitalisering Noordzee

Vanuit dit bredere concept van de Digitale Noordzee hebben zich inmiddels op verschillende niveaus initiatieven ontplooid, bijvoorbeeld om te onderzoeken waar de informatiegaten zich bevinden en of/hoe deze kunnen worden gevuld. Op operationeel niveau hebben vertegenwoordigers van KNMI, Luchtverkeersleiding Nederland (LVNL), Kustwacht, Energie Beheer Nederland (EBN), NOGEPA en RWS in een werkgroep "Decommissioning en sensoren" samengewerkt om de problemen en oplossingsrichtingen in kaart te brengen. Dit voorbereidende werk heeft geresulteerd in een opdracht van het Interdepartementaal Directeurenoverleg Noordzee (IDON) om het concept van de digitalisering van de Noordzee in een interdepartementale werkgroep "Digitalisering Noordzee" verder uit te werken en te komen tot een voorstel voor een "Uitvoeringsprogramma Digitalisering Noordzee" met investeringsplan voor de realisatie daarvan.

IDON heeft gekozen voor een stapsgewijze benadering en de huidige opdracht beperkt zich tot stap 1, waarin de toekomstige informatiebehoefte van de diverse stakeholders in beeld wordt gebracht en de daarbij benodigde IV-infrastructuur en de connectiviteitseisen – beschikbaarheid, bandbreedte, *latency* (vertraging), etc. – voor digitale connectiviteit op de Noordzee voor verschillende (missiekritische) bedrijfsprocessen, systemen en sensoren. Tevens worden de verschillen in de geografie van de Noordzee (zuid, midden, noord) meegenomen; deze bepalen immers mede de urgentie.

De werkgroep werkt mede met input van de beleidsdepartementen in eerste instantie aan een gezamenlijk beeld van de scope en het streefniveau van de digitalisering voor de middellange (2030-2040) en lange termijn (na 2040). Voor de periode 2022-2030 zal worden bepaald wat nodig is om de basisinfrastructuur op orde te brengen.

## Essentieel voor beleidsamibities

Digitalisering van de Noordzee is van essentieel belang om nationale en Europese beleidsambities te verwezenlijken en de positie van Nederland als maritieme (en digitaliserings-)koploper te bestendigen. De weg van digitalisering is noodzakelijk om de Nederlandse duurzame blauwe economie te laten groeien, waarbij we de energie-, voedsel- en natuurtransities faciliteren, de klimaatdoelstellingen halen en de veiligheid op zee én op land vergroten. Maar ook om de kwaliteit van het Noordzeemilieu te behouden, de Noordzeehavens bereikbaar te houden, het weer betrouwbaar te voorspellen en (missie-kritische) dienstverlening op niveau te houden.

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# A CHANGING LANDSCAPE FOR OFFSHORE WIND

**The offshore wind sector has seen a rapid transformation over the past twenty years. From the first offshore wind farm installed in Vindeby, Denmark, in 1991 comprising eleven 0.45-megawatt (MW) wind turbines (WTs) with a total capacity of 4.95 MW to wind farms with more than fifty to 100 WT installations and a total capacity of over 1000 MW. Furthermore, the size of individual WTs is increasing to 15 MW. Lloyd's Register's George Kallenos examines the role of third-party certification in risk mitigation as the sector continues to grow and expand in new territories.**

The next frontier for the offshore wind sector is the development and upscaling of floating wind farms. Over the last ten years, we've seen prototype single WT installations and pilot wind farm projects comprising of a few WTs that have a maximum single wind farm installation capacity of 50 MW. Yet, their scale has yet to reach that of fixed offshore wind farms. As each installation occupies a larger seabed footprint and moves further offshore into deeper waters and harsher, more severe environmental conditions, new challenges will need to be addressed in order to support the development of floating offshore wind and enable its success.

As the offshore wind sector moves into this new frontier, project certification and the role of independent certification bodies will remain an important piece of the puzzle, for both fixed and floating wind projects, providing confidence and assurance to the project stakeholders regarding the integrity and safety of their assets.

## Certification schemes and national requirements

Like other forms of offshore energy assets, whether fixed platforms, floating platforms, and/or pipelines, offshore renewables (WTs, their support structures, fixed or floating, cables and other supporting infrastructure, such as substations) tend to be certified by independent certification bodies. In some instances, this is to comply with national regulatory requirements, such as in the Netherlands, Germany, Denmark, and the USA, to name a few. Regulatory requirements are an ever-evolving landscape, as more countries make plans for the deployment of offshore wind and countries with existing requirements amend these to accommodate the development of floating wind.

Yet, quite often, the involvement of certification bodies is requested by the project developer/owner and requirements of other project stakeholders. Currently, there are two main project certification schemes that are implemented and widely recognised by offshore wind stakeholders. The international standard "IEC 61400-22:2010 – Wind turbines – Part 22: Conformity testing and certification", which was withdrawn in August 2018, but is still used within the sector, and the operational document "IECRE OD-502:2018 – Project Certification Scheme", which replaces the project certification sec-

*Photo: A floating wind turbine developed by BW Ideol (by Lo83/Wikimedia).*

tion of the IEC 61400-22:2010 standard. These schemes encompass the project lifecycle, ranging from the assessment of the project site conditions, the evaluation of design, the evaluation and surveillance during manufacturing, transport and installation, as well as the surveillance of commissioning activities. Where national requirements apply, the aforementioned project certification schemes can still be applied in support of specific national requirements. Certification schemes can also include surveillance during the operation and maintenance stage of a project, after the project certificate has been issued.

## The value of independent certification

Independent certification can offer different benefits to various offshore wind project stakeholders. For example, third-party evaluation and certification can provide assurance that the asset is in compliance with the selected project certification scheme and corresponding codes and standards, and because of this, project certification is often requested by project developers/owners.
Project certification can also be used by project developers/owners to secure project financing as well as the required and appropriate insurance cover. This can either be during the early project development stages or later in the financial investment decision stage.
In addition, project certification can be a suitable vehicle to support new, less experienced entrants to the offshore wind sector. Although many of these new entrants have a vast, and to a large extent, transferrable project development experience from other offshore, maritime and power sectors, working with a certification body through project certification can add benefits to the project through the wealth of knowledge and experience such bodies can bring to the table. This is particularly useful when it comes to applying best industry practices for new technologies.
Importantly, project certification can also be used to mitigate risk. This can range from risk with respect to the feasibility of the proposed design, to risk associated with the manufacturing and installation stages, and to financial risks related to securing investment and the overall project budget. The timely identification of risk allows for solutions and mitigations to be applied at an early stage, which can minimise significant issues arising later that could be more difficult and costly to resolve.

## How does the certification process work?

The certification process does not vary significantly with respect to the basic principles in other offshore sectors, such as oil and gas and maritime. The difference is mainly due to the nature of offshore wind certification schemes in that they are not mandatory, except when national regulatory requirements apply. This, and the modular approach of the previously referenced certification schemes, which consist of eleven mandatory and four optional modules, enables certain flexibility in how project certification can be applied. For example, project developers/owners can focus on the items that they deem most important and valuable, as well as those that will satisfy their internal requirements. Mandatory modules include the evaluation of site conditions, design basis and detailed WT support structure modules, along with the manufacturing, transport and installation and commissioning surveillance modules. Optional modules include the design evaluation and manufacturing surveillance of "other installations", such as the offshore substation, along with the project characteristics measurements and operation and maintenance surveillance modules.
Although it should be noted that "mandatory" modules with respect to the project certification schemes refer to whether a module is mandatory for an overall project certificate standpoint, and does not refer to the overall requirement for certification from any regulatory requirements.
The majority of the certification activities takes place during the project development phase, as there are no mandatory requirements in most cases for involvement during the operational phase. There is an operational and maintenance module within the mentioned certification schemes, but it is not typically requested. Germany is one such example where regulations do require involvement in the operational phase. In the near future, with the deployment of floating wind, this might change, as for these units a kind of classification system with periodical surveys is being considered.

> Project certification can also be used to mitigate risk

## Challenges in the North Sea

The North Sea presents a wide range of seabed and geotechnical challenges to wind farm development that can be overcome if they are appropriately managed. Challenges can range from mobile seabed, uneven bathymetry, shallow gas, boulders and unconventional soil types such as organic soils and silt.
Geophysical and geotechnical site investigation data can help identify such challenges. If used effectively, this data can help developers/owners to identify suitable locations for the development and selection of foundation concepts as well as identify any potential hazards that need to be mitigated during the wind farm development process. Early engagement with a certification body can help the project developer/owner navigate and alleviate such challenges by reviewing the data collection campaign plan, which can be costly and time consuming, to ensure appropriate data is collected and used effectively by the project team.
However, if the data is not properly utilised by the developer, designer or other project participants at the start of the project, or as soon as they receive such data, this can delay the identification of potential issues and can become costly or time consuming to resolve.

## Recommended Practice for floating offshore wind farms

To support the development of floating offshore wind, Lloyd's Register (LR) is due to publish its Recommended Practice (RP) for floating

*The Kincardine floating wind farm off the coast of Aberdeen will be the world's largest floating offshore wind farm to date (photo Cobra Group).*

offshore wind farms in 2022. The RP will support facilities across the range of regulatory requirements that are evolving around the world, drawing together not only the various engineering disciplines, but also promoting collaboration across the design, construction and operational phases of such projects. The goal is to help project developers and other stakeholders in addressing the major engineering challenges and technology step outs that are required in this advancing field, especially with the rapid rise in turbine output. LR is well placed to support these developments, leveraging its long-established experience within the offshore and marine industries, and experience with regulatory and technical matters such as mooring, hydrodynamics and others.

Certification can provide oversight and inputs that support factual decision making

In addition to this, LR is an IECRE (IEC System for Certification to Standards Relating to Equipment for Use in Renewable Energy Applications) recognised Renewable Energy Certification Body (RECB) for project certification, which enables it to certify wind farm projects in accordance with the IECRE scheme, the Operational Document IECRE OD-502 and its associated requirements. The classification society is also an accredited ISO 17065 Certification Body by the UKAS (United Kingdom Accreditation Service) and can offer wind farm project certification services in accordance with the IEC 61400-22 requirements. An example of LR's work includes the recent certification of the Blauwwind Borssele III & IV offshore wind farm in the Netherlands. LR undertook certification activities, as well as incorporating the work of other parties in its evaluation, before issuing the project certificate to Blauwwind for its Borssele III & IV offshore wind farm project. This was in compliance with the requirements of Water Decree Article 6.16g of Rijkswaterstaat Zee en Delta of the Ministry of Infrastructure and Water Management, Section Inspection and Law Enforcement at Rijkswaterstaat (RWS). Borssele III & IV comprising of 77 wind turbines on monopile foundations with an installed capacity of 731.5 MW, will produce enough power to provide approximately 825,000 households in the Netherlands with renewable electricity and make up 2.3 per cent of the country's total electricity demand. When implemented correctly, project certification can add significant value to a project by providing meaningful oversight and inputs, which in turn support factual decision making as well as help prevent project delays and costly overruns. To gain the most out of this process, project certification should be considered as a collaborative undertaking by the project developer/owner and the certification body, rather than as a routine task that needs to be completed and signed-off.

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# WEL OF NIET MEEPRATEN OVER 'NIEUWE' NOORDZEE?

## Tot medio 2023 breed onderzoek naar gevolgen Noordzeebeleid op visserij

**De visserij zit wat betreft het toekomstige beleid voor de Noordzee in een lastig parket. Wie wil meepraten in het brede Noordzeeoverleg, dat het Nationaal Programma Noordzee voor 2022 tot 2027 opstelt, moet het Noordzeeakkoord van juni 2020 ondertekenen. Maar dat heeft onze visserij in meerderheid niet gedaan, vertelt voorzitter Jacob van Urk van de PO Urk. 'Want wat is een visserij van een andere aard en omvang? Passieve visserij? Wat betekent dat concreet? Blijft er nog ruimte voor ons type visserij en schepen, of moet dat allemaal verdwijnen?'**

*De Nederlanders mogen in Britse wateren blijven vissen, maar krijgen wel te maken met andere regels. Jacob Van Urk van de PO Urk bij vier nieuwe achtereinden voor zijn kreeftennetten, omdat de Britten de mazen 15 millimeter groter willen hebben om kleinere dieren makkelijker te laten ontsnappen (foto Sander Klos).*

In een onderzoek door Wageningen Economic Research in opdracht van het ministerie van Landbouw, Natuur en Voedselkwaliteit (LNV) wordt alles wat op de Noordzee gebeurt onderzocht om te zien welke gevolgen het heeft voor de vloot, de keten en de visserijgemeentes/regio's. Dan gaat het om ontwikkelingen als Waddenagenda, Kottervisie, Brexit en de gebiedssluitingen voor wind en natuur. Naast het verzamelen en analyseren van economische data worden focusgroepen gevormd en vissers geïnterviewd. Het onderzoek loopt van januari 2022 tot juli 2023 en de eerste resultaten worden in mei/juni 2022 verwacht, stelt LNV.

### Wie sluit zich aan?

Die visserijmeerderheid tegen het Noodzeeakkoord is een beetje hogere wiskunde, want de producentenorganisaties Delta Zuid, Rousant, Redersvereniging voor de Zeevisserij, Texel, West en Wieringen en de Vereniging NetVISwerk stemden in, maar konden niet tekenen, omdat de PO Urk en PO Vissersbond, samen goed voor de meeste leden, er anders over denken. 'De sector is verdeeld, maar de gezamenlijk PO's zijn nog in gesprek over mogelijke deelname aan het Noordzeeoverleg', zegt Van Urk. Hij vermoedt dat enkele PO's overwegen toch aan de onderhandelingstafel aan te schuiven. Die zij dan delen met de natuur-NGO's, of 'nooit genoeg organisaties', zoals Van Urk ze ervaart, plus scheepvaart, energie en Rijk, met elk drie zetels.

### Ondergeschikt

Grootste pijn bij Van Urk is het gevoel, dat de visserijbelangen ondergeschikt zijn aan die van andere gebruikers van de zee, zoals 'windboeren' en NGO's. 'Tot 2030 moet veel meer windenergie op

zee komen, dus hebben die producenten vrij spel. En de NGO's krijgen een speeltuin van vijftien procent aan gesloten gebieden op ons continentaal plat. Terwijl de visserij nog een kater heeft van de scholbox, die als gesloten gebied niet heeft opgeleverd wat werd verwacht. De NGO's hebben inmiddels hun ambitie opgeschroefd naar dertig procent beschermde gebieden op de Noordzee. Er staat druk op de garnalenvisserij binnen de twaalf mijl, terwijl net buiten die zone een passerende containercarrier net zoveel stikstof uitstoot als die hele garnalenvloot in een jaar.'
Kerngebieden voor de visserij zijn onder meer het Friese front benoorden de Waddenzee, de Doggersbank, de Bruine Bank op de grens met Brits water ter hoogte van IJmuiden en de tongbestekken net buiten de twaalfmijlszone.
Volgens hem wil een partij als Stichting De Noordzee 'helemaal van de bodemberoerende visserij af. Bekend is de boomkor op vooral tong, schol en tarbot. De Nederlandse vloot gebruikt daarnaast het flyshooten op mul, rode poon en inktvis en de bordenvisserij op schol en langoustines. Gericht op kabeljauw wordt bijna niet meer gevist, daar zijn geen quota voor. De volgens vissers minder schadelijke pulsvisserij stuitte op een veto van de EU en krijgt wellicht ooit een nieuwe kans, al zien vissers dat voorlopig niet gebeuren.'
Van Urk vervolgt: 'De visserij is vooral zo tegen het Noordzeeakkoord, omdat daarin geen enkele ruimte is om windparken en natuurgebieden te combineren. Het is en-en. Daardoor blijft veel te weinig ruimte over voor de vissers, die op de overgebleven Noordzee ook niet overal de beste visgronden overhouden, omdat dat frappant genoeg ook de beste natuurgebieden blijken te zijn, of doordat er windmolens worden geplaatst.'
De plannen voor windenergie lijken op lange termijn richting veertig procent ruimtegebruik te gaan. Het Planbureau voor de Leefomgeving noemt 26 procent.

## MINISTERIE WIL BESCHERMING SNEL DOOR EU-PROCEDURE LEIDEN

Begin november legde de overheid uit wat de gebiedsbescherming in het Noordzeeakkoord inhoudt. Die bescherming krijgt onder andere vorm door visserijactiviteiten te verbieden. We citeren deelnemer Durk van Tuinen van de Nederlandse Vissersbond: 'Men werkt aan bescherming van zeven gebieden die ook in het Noordzeeakkoord staan: Doggersbank, Klaverbank, Bruine Bank, Friese Front, Centrale Oestergronden, Borkumse Stenen en de Noordzeekustzone. Per gebied gelden specifieke plannen en in veel gevallen betekent het geen volledige sluiting. LNV gaf aan dat met betrekking tot de Doggersbank opnieuw moet worden afgestemd met het Verenigd Koninkrijk (VK). Het gebied grenst aan het VK en door de Brexit zijn daar aanvullende stappen nodig. De bescherming van de Bruine Bank gebeurt op basis van de Vogelrichtlijn, wat betekent dat er vooralsnog geen gevolgen zijn voor gesleepte visserijtechnieken, maar wel voor staandwantvisserij.'
Van Tuinen: 'Zoals in het Noordzeeakkoord gesteld, wil men de bescherming en dus sluiting voor in elk geval bodemberoerende visserij per 2023 invoeren. Die maatregelen lopen via het Gemeenschappelijk Visserijbeleid van de Europese Unie. Gewoonlijk neemt dat enkele jaren in beslag, nu probeert men dat binnen een jaar te realiseren. Mogelijk komen er zeven aparte procedures, zodat nog aanpassingen mogelijk zijn, bijvoorbeeld aan de Borkumse Stenen, Friese Front en Doggersbank.'

### Nieuwe balans zoeken

Het Noordzeeakkoord zegt in het kort, dat op de drukke Noordzee nu al grote spanning bestaat tussen scheepvaart, natuur, energie en voedselvoorziening (met name visserij). We citeren: 'Het Klimaatakkoord zal de komende decennia leiden tot een forse groei van windparken op zee. Dat wordt passen en meten. We zien het als onze opdracht in de botsing tussen belangen een nieuwe balans te zoeken. Het Rijk stelt 200 miljoen euro beschikbaar ter ondersteuning van de met elkaar samenhangende natuur-, voedsel- en energietransities. Zo'n nieuwe balans vraagt van alle partijen de bereidheid niet alleen vanuit de eigen invalshoek te redeneren, maar ook vanuit de gezondheid van de Noordzee als geheel. Juist omdat de druk op de Noordzee toeneemt, is extra inspanning nodig om de kwaliteit van het ecosysteem (waaronder biodiversiteit) te bewaren én te verbeteren. We moeten meer doen voor een gezonde Noordzee, zowel in gebiedsbescherming als in bescherming van soorten en aanvullende maatregelen om negatieve effecten op de natuur te beperken.'

> 'Het geld voor de transities op de Noordzee moet voor een fors deel naar de herstructurering van de visserij'

'We hebben intensief aandacht gegeven aan een toekomstbestendige visserij. Aard en omvang van de vloot zullen in de toekomst moeten passen in een gezonde Noordzee. Alle partijen begrijpen dat het geld voor de transities op de Noordzee voor een fors deel aan de herstructurering van de visserij moet worden besteed. Draagvlak daarvoor is vooral ontstaan doordat afspraken zijn gemaakt om ecologisch belangrijke gebieden te vrijwaren van bodemberoerende visserij.'

### Toekomst VisNed

Tot overmaat van ramp sneuvelde na ruim een jaar gesteggel afgelopen zomer ook de koepel VisNed, wat de belangenbehartiging van de visserij geen goed doet. Wel loopt na twee jaar weer overleg over de Kottervisie, waaraan VisNed-directeur Pim Visser en zijn team medewerkers veel bijdroegen. Van Urk: 'In dat Aanvoeroverleg

## VISSERSBOND: SPREKEN UIT ÉÉN MOND NADERT

Voorzitter Johan Nooitgedagt van de Vissersbond noemt de verdeeldheid in de kottersector 'relatief'. 'Ik heb de overtuiging dat de tijd nadert dat de kottersector vanuit één mond zal spreken en veel meer samenwerkt. Dat is niet een kwestie van even een knop omzetten, maar van een andere cultuur "organiseren". Allemaal individueel denken is een luxe die we ons niet langer kunnen permitteren. Ook het Noordzeeakkoord heeft geleerd dat we in de kottersector ons verhaal vanuit één mond moeten brengen.' 'In de gesprekken over het Noordzeeakkoord heb ik het met bemiddelaars en voorzitters van het Noordzeeoverleg altijd gehad over een visie voor de kottersector. Daarbij stond voor mij voorop, dat wij als eerste visserijland vis kunnen leveren die is gevangen zonder fossiele energiedrager. Dat is een uitdaging die we moeten aangaan en daar is durf en lef voor nodig. Maar dat mag niet betekenen, dat we kostbare visgronden kwijtraken. Dergelijke grote gedachtenverschuivingen zitten helaas niet in het Noordzeeakkoord. Van de miljarden die ons eerder zijn toegezegd is niets terechtgekomen en dat stelt teleur. Brussel heeft zelfs een vrijwillige saneringsregeling afgewezen, dus sta je op enig moment met lege handen. Wanneer een minister dat in Brussel niet voor elkaar kan krijgen, wat kun je dan verwachten van een visserijvoorman? Vaders zitten huilend bij mij aan tafel, omdat ze geen renderend bedrijf en toekomstperspectief aan hun zoon kunnen overdragen. Vissers zijn bezig met innovatieve schepen, maar wat als we géén visgronden meer hebben doordat er allemaal windmolens staan en de rest natuurgebied is geworden?'

zitten we weer regelmatig om tafel met het ministerie, alle PO's en de inspectiedienst NVWA (vroegere (AID). Dus zonder NGO's, zoals het hoort.'
VisNed meldt deze maand een nieuwe overlegstructuur met het ministerie 'waarbij min of meer alle beleidsonderwerpen in één maandelijks overleg worden samengebracht' om 'te werken aan een gezamenlijk doel voor de toekomst van de visserij. Na een half jaar wordt dit overleg geëvalueerd.'

### 'Ken je plek'

Pim Visser van VisNed betreurt het wegvallen van zijn zeskoppige team. 'Alles wat we in twaalf jaar hebben opgebouwd, is in één klap weg: onze relaties met Den Haag en Brussel, met NGO's, met belangrijke wetenschappers.' Alleen Geert Meun op Urk is nog over en de PO Urk fungeert als opvolger en onderhoudt de website van VisNed. 'Als visserij moet je je afvragen welke positie je inneemt tussen de overige gebruikers van de Noordzee en wat de maatschappij vindt. Misschien was het ooit "jouw zee", maar dat is gewoon veranderd. Vraag je af of je zo slecht af bent, nu Nederland tot 2030 vijftien procent van de zeegebieden wil sluiten, waar de EU mikte op dertig procent. En wees je bewust van je economische belang. Eén windpark heeft meer impact dan de omzet van de hele Nederlandse vissersvloot. Je hoeft jezelf geen Calimero te maken; je bent een volwaardige overlegpartner, maar je moet wel willen bewegen wanneer omstandigheden veranderen. We moeten als sector ook kritisch naar onszelf kijken. Neem het pulsdossier; bij nader inzien en ja, dat is wijsheid achteraf, hadden we natuurlijk nooit zoveel ontheffingen (84) moeten vragen. En bij de mogelijke opvolger, de waterspray, lopen we eenzelfde risico als we geen lessen trekken uit de afloop van de puls.'

> 'We hopen op wonderaccu's, want de UK 205 kan nu elektrisch alleen een rondje door de haven doen'

### Wie z'n visie?

Wat dat betreft is hij ook niet optimistisch over de Kottervisie. 'Ons team had twee jaar geleden die visie op papier gezet. Maar nu lijkt het erop, dat de visserij aan het ministerie vraagt om een visie te bedenken. Dat is geen gebruikelijke volgorde. De sector kan beter zelf met een visie komen en daar steun voor zoeken. Basisprobleem is volgens mij, dat er structureel te weinig wordt verdiend. En er lijkt daardoor veel animo om te saneren.'
Volgens Visser klopt het niet als de visserij de schuld legt bij het Noordzeeakkoord en -overleg. 'De maatregelen in dat akkoord komen uit de Kaderrichtlijn Mariene Strategie, Natura 2000, het Kli-

*Pim Visser: 'Welke positie heb je onder andere Noordzeegebruikers?' (archieffoto Sander Klos).*

maatakkoord en de noodzaak $CO_2$-uitstoot te verlagen, inclusief de afbouw van het Groningse gas. Tegenstanders van het in gesprek blijven over al deze bedreigingen stellen zichzelf gerust met de juridische beroepsmogelijkheden. Maar zit je niet aan tafel en zijn de plannen gemaakt, dan ben je in feite te laat. En dan mag je wel een budget van 150.000 euro per jaar voor juridische bijstand uittrekken, met een heel beperkte kans op succes.'
Visser: 'Dat is ook in lijn met de instemming die Johan Nooitgedagt en ik in februari 2020 namens de hele sector (met uitzondering van PO Urk) aan het onderhandelaarsakkoord hebben gegeven. Dat na ledenconsultaties PO's van mening zijn veranderd, is overigens ook realiteit.' Hij deelt de mening van Van Urk, dat het zomaar zou kunnen dat PO's als Texel, West en Wieringen met NetViswerk en de Pelagische Reders binnenkort alsnog aanschuiven bij het Noordzeeoverleg.

## Sanering en nuluitstoot

Van Urk onderkent dat een reorganisatie of sanering in de visserij onontkoombaar is. Soms vanwege beperkingen, soms door gemis aan opvolging of te weinig exploitatiemogelijkheden. 'Op Urk zal het om een stuk of tien kotters gaan. Je moet dan je kotter slopen, je raakt je kW's en GT's kwijt, moet afrekenen met de fiscus en mag dan vijf jaar niet meer vissen.'

Ook vergroening heeft de aandacht. 'We moeten richting 2050 naar nul uitstoot, dat is duidelijk.'
Maar ook de mening van de maatschappij speelt een rol. 'Het opvissen van ons tongquotum was altijd het draagvlak voor de breedte van onze vloot, maar die vorm van visserij kostte wel veel energie. Je ziet nu zuinigere scheepsontwerpen, zoals die van Padmos, en niemand haalt het meer in zijn hoofd om 2000 pk te zetten. Waterstof kan een deel van de oplossing zijn en we hopen op wonderaccu's, want de UK 205 kan nu elektrisch een rondje door de haven doen, maar dan houdt het op. En voor al die nieuwe energiesoorten zijn ook bunkerpunten nodig.'

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# HYPERSONIC MISSILES DISRUPT NAVAL WARFARE

**Recently, North Korea and Russia tested hypersonic missiles, while China tested such a weapon with surprising success in July this year. Australia, India, France, Germany and Japan are carrying out research. The US will accelerate developments and wants to start production next year.**

Hypersonic weapons travel at a very high speed of more than Mach 5. One distinguishes hypersonic glide vehicles, which are launched from a rocket before gliding to a target, and hypersonic cruise missiles, which are powered by high-speed, air-breathing engines during flight. Ballistic missiles also achieve very high speeds, but only in the last, descending part of their parabolic, predictable trajectory. Hypersonic missiles can reach their target along a nearly horizontal path, keeping them invisible to radar until the last moment. And because the missile is highly manoeuvrable in a unpredictable way, the target can be reached, evading defence systems from heavily-defended targets (such as an aircraft carrier). The reaction time for a ship relying on its own sensors will be very short.

The missiles can carry conventional or nuclear payloads, but the kinetic energy will be sufficient to destroy ships. Let me limit myself to naval ships.

In March 2021, information was asked by the US Navy on how to reconfigure the Zumwalt to host hypersonic missiles to remove the two 155-mm Advanced Gun Systems, which are no longer useful, because the ammunition (Long Range Land Attack Projectile) has been cancelled due to far too high costs. The stealthy frigate, with low risk of detection, will be equipped with cannisters for twelve hypersonic (conventional Prompt Strike) missiles and could fulfill a strike role deterrence in 2025 [1]. Later, in 2028, the Virginia class submarines will be equipped with the hypersonic missiles. The missile and the defence against these missiles are one of highest research and engineering priorities [2].

The Royal Netherlands Navy has been participating in the current NATO Ballistic Missile Defence project for some time now. Sensor and command systems of the Air Defence and Command Frigate (LCF) have recently been updated. A new radar system has been installed. This so called SMART-L MM/N radar is capable of detecting missiles at very long distances. The ship is also equipped with infrared sensors. This is important because even conventional ballistic missiles are heated strongly by the high speeds. The ship is equipped with the Standard Missile-2 (SM2) and the Evolved Sea Sparrow Missile system (ESSM). The ESSM is designed to counter supersonic manoeuvring anti-ship missiles.This missile is currently in service with the thirteen members of the Sea Sparrow consortium. However, to intercept a ballistic missile (with speeds < Mach 4), the frigate must be equipped with the SM3. But intercepting and destroying a hypersonic missile with these systems on board of the LCF is impossible.

## Above Water Warfare System

Anticipating these new threats, Thales Netherlands is developing

*Photo: Hypersonic weapons travel at a very high speed of more than Mach 5 (by DARPA).*

the Above Water Warfare System (AWWS) with DMO (Dutch Defence Materiel Organisation) and TNO (the Netherlands Organisation for Applied Scientific Research). Hopefully, this system can contribute to hypersonic missile defence in the future. The system will use information from all available sensors as well as from satellites to arrange an optimal deployment of the weapons under all circumstances and threats, including multiple simultaneous attacks with very short reaction times. The system will make use of artificial intelligence, which will of course continue to evolve (learning machine). The very short reaction times with threats from every direction will (most likely) make it rather impossible for the crew to have any influence on the process. It will be developed as an autonomous system.

The first vessels to be equipped with the AWWS are the Anti-Submarine Warfare Frigate and the German MKS 180.

That little or no information could be found about navigation, control systems and how to guide the missile to the target, is because of classification. High temperature effects (for example aero-thermo elasticity) are mentioned as major challenges. Some papers mentioned inertial and satellite navigation. Because the missile flies in a low horizontal orbit, observation from multiple satellites will apparently be the only way of following the missile and guiding it to the target or in case of defence reacting in time [3]. Interesting, but complicated lectures are published about the methodology of designing autonomous non-linear control systems [4].

## Disruptive technology

Anyhow, the introduction of the hypersonic missile is disturbing and may disrupt the balance of power or even increase the risk of armed conflict. Recently, photos circulated on the internet of a mock-up of a US aircraft carrier somewhere in a desert in China, apparently with the intent to practice attacks. The eleven or twelve aircraft carriers are the back-bone of the US Navy. And the question is, what will the effect of the new threats be on the survivability of these capital ships?

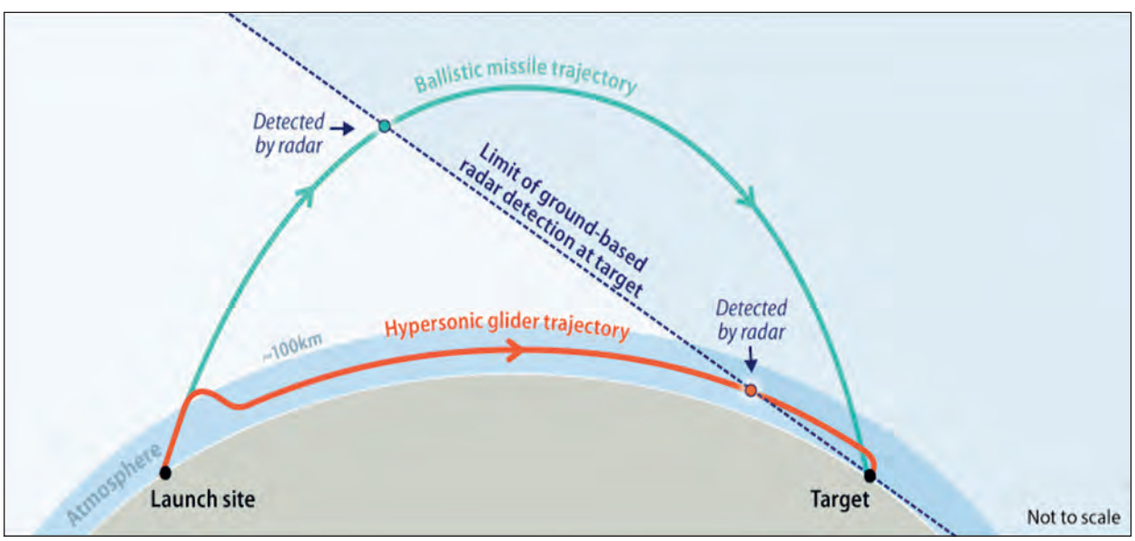
These developments have given rise to the US Ministry of Defence to reconsider its naval policy. Another driver of course for policy review is China's growing naval power and its apparent quest for supremacy. That also applies to Russia.

In an article in Maritime Policy Strategy & Forces of September 2021 is written: 'The new goal is expected to introduce a new, more distributed fleet architecture featuring a smaller proportion of larger ships, a larger proportion of smaller ships, and a new third tier of large unmanned vehicles.'

Intercepting and destroying a hypersonic missile with the systems on board the LCF is impossible

Warship Technology of May 2021 said about the Joint Navy/Marine Corp plan: 'The document states that the global security environment has seen a return to Great Power Competition and that the department of the navy is at an inflection point where traditional force structure will not be enough in the face of new warfighting demands' and 'autonomous systems are not a replacement; they provide additional capacity and capability to our combatant force and allow commanders the ability to accept risk where they could not before.'

The US Defence Advanced Research Project Agency (DARPA) announced in Warship Technology of January 2021 a project called "No Manning Required Ship" (NOMARS), which aims to 'disrupt conventional naval architecture designs through creative trade space explorations.' The article also added: 'The intent of this effort is to create a paradigm shift in the design of surface vehicles as we transition from manned to unmanned platforms, as we are leverag-




*Hypersonic missiles can reach their target along a nearly horizontal path.*


*The Echo Voyager is a fully autonomous extra large unmanned undersea vehicle (XLUUV) that can be used for a variety of missions that were previously impossible due to traditional UUV limitations (photo Boeing).*

ing newly established and developmental technologies to increase capability, increase reliability, and reduce total ownership cost.'

## Trends in naval shipbuilding

From the above quotes from US papers, the following trends in naval shipbuilding can be noticed:

- As weapons become more and more lethal and unstoppable, risks will or must be spread by deploying more smaller vessels and fewer larger ones.
- Rapid development of unmanned systems will result in increased application, faster than we might suspect. (If we are going to be able to combat mines with such systems, then why not detect and disable submarines by (underwater) unmanned vehicles?)
- Although new laser systems have been successfully tested to detect submarines [5], they will never be a target for a missile and therefore a very survivable naval weapon system, manned or unmanned.

With the introduction of the hypersonic missile, the world will not become a safer place. There is a sculpture in the building of the United Nations in New York, given by an "enemy" country, with a text from Isaiah 2:4 that ends as follows: 'Nation shall not lift up sword against nation, neither shall they learn war anymore.'

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# RESTORING CONFIDENCE IN THE SAFETY OF CONTAINER SHIPS

## MARIN's TopTier JIP

**The loss of containers and their impact on marine and coastal environments raised public and political concerns on the safety and environmental impact of modern container ships. In September 2020, MARIN launched the Joint Industry Project (JIP) "TopTier" in order to improve the safety of container handling and operation.**

Recent incidents have put container ships under a magnifying glass. The container ship MSC Zoe lost 342 containers (TEU, twenty foot equivalent unit) north of the Dutch Wadden Islands in early January 2019. In November 2020, the container ship One Apus lost 1800 TEUs nortwest of Hawai in bad weather. Last year, about 3000 containers were lost in the Pacific Ocean alone. A total of 226 million TEU was transported at the time. Each TEU with cargo inside is estimated on average to be worth USD 50,000, which gives a total of USD 150 million in losses annually. On top of that comes possible pollution, danger to navigation due to partly submerged containers and toxic substances being released. The time is now ripe to gather representatives from the container shipping industry and see what can be done to improve the situation within sea transport of containers.
One of the problems is the rapid growth of container ships:

- 1968 – 1530 TEU was a reasonable size.
- 1996 – 6400 TEU was a good size.
- 2020 – 24,000 TEU ships are the largest container ships available. At present, a series of twelve such ships are being delivered.

### Objectives

TopTier can be seen as a continuation of the JIP Lashing@Sea (2006-2009). The objective of the new JIP is to produce guidelines about ship design, container code (strength) and container securing to lower the probability of loss of containers at sea. There are a number of unknown factors that all play an important role in the safe transport of containers at sea:

- Cargo weight and centre of gravity: Container weights given are often wrong and the centre of gravity is usually not known.

*Photo: Container loss seems to happen ever more frequently. Have container ships outgrown the current regulations? (Picture by Photocapy/Flickr.)*

- Ship movements: The motion response in a seaway of these very large container carriers is not very well known. The GM (metacentric height) can be between 2 and 15 metres for a large container ship, depending on loading.
- Weather: Weather routing is an important factor in the safety of the ship.
- Crew attitude: Competence and experience with very large container carriers.
- Ship global strength.
- Life endurance of lashing equipment, also pad-eyes for turnbuckles etc.

## Scope of work

The JIP is structured in five tasks:

1. Present situation with container operations, interviews and such with persons in the field.
2. Current practice from the regulators' point of view.
3. Improving cargo securing designs by new findings from full-scale measurements and model testing.
4. Improve the awareness of the crew and the stevedores to the forces occurring at sea.
5. The results from the above to be presented to relevant authorities such as the International Maritime Organization (IMO), the International Labour Organization (ILO) and the International Association of Classification Societies (IACS).

Participants include ship operators, national authorities, classification societies, port authorities, terminal operators, P&I Clubs and insurance, lashing gear manufacturers, workers' representatives, onboard system developers and independent R&D institutes.

## Meeting end of September 2021

The meeting at the end of September 2021 was held electronically with about 95 participants. This was the first meeting with the project group about one year after the start of the project. Due to different time zones from North America via Wageningen, the Netherlands, to Japan and eastern Australia, the meeting was split up in two parts. It was decided to split up the participants into six working groups, each with its own specific task:

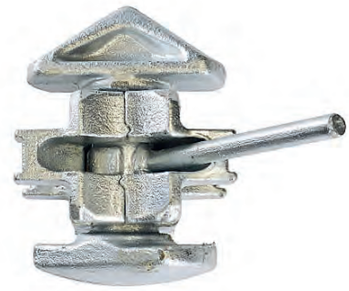
1. Limits.
2. Uncertainties.
3. Design criteria – Motions.
4. Securing loads.
5. Operational guidance.
6. Regulatory framework.

Each working group will report to the project group with their findings and the end result will be used to influence IMO and the classification societies to improve their guidelines, rules and regulations in order to improve container operations at sea and make it safer for all parties involved.

## Securing containers

Containers above a certain height will not have the support of the fixed container guides and will have to be secured using special container lashing equipment. This may be:

*Knob lashing bar (courtesy of ILS).*



*Twist lock (courtesy of ILS).*

- Twist locks.
- Stacking cones.
- Lashing rods.
- Extension pieces.
- Turnbuckles.

The number of lashing equipment on board is mentioned in the Cargo Securing Manual as well as the type of equipment available.
A "knob lashing bar" is designed with the top device to fit into the corner fitting and with tension on the rod or bar, it will then secure the container. This requires the corner fitting to be intact and not to be damaged mechanically or by corrosion. Twist locks require maintenance. Without maintenance, they will not function properly and may even fail entirely.

Without maintenance, twist locks will not function properly and may fail entirely

All this special lashing equipment is normally designed to a breaking load tension of 500 kN, with a safety factor of two, which means the safe working load (SWL) is 250 kN. The various lashing eyes fitted to the ship construction must also be designed for the tensions expected. In the offshore oil industry, lashing eyes/hoisting eyes must be inspected and tested annually, but this is not the case on commercial vessels.
Containers need to be surveyed after five years and after the first survey, annually. The most important parts of a shipping container are the corner fittings and the four vertical corner posts. If a corner post has been damaged by outer force (forklift truck?) or the load on the container is too high due to the weight of the containers stacked on top, the corner post(s) will buckle. This results in the lashings loosening and the tack will fail. The load on a particular container is also influenced by the tensions in the lashings and the ship's movement resulting in accelerations, which in bad weather can be very high.


*Turnbuckles.*

The weight of each individual container must be verified either by weighing the container or by specifying the content with individual weights. Modern container terminals have a computerised container handling system, but many ports lack this feature and the stowage of containers on board may not always be ideal with respect to weight distribution.

Modern container ships are so large that the person in command does not have a "feel" for the ship

## Ship's motions

The motions of a particular ship are sometimes tested in a model tank with a wave maker. The problem with this is that, in practice, the motions can vary in a wide spectrum depending on loading conditions (GM can vary between 2-15 metres depending on the loading situation), weather, water depth, current and the heading relative to the waves, and wind. Phenomena like parametric roll also need to be considered. The motions result in vertical and horizontal accelerations in three axis and these accelerations have a huge influence on the container stacks and their ability to survive.

Bilge keels have a large influence on roll damping of a ship. The new modern super container carriers with a beam of over 60 metres have the same depth of bilge keels (600 mm) as the old 20-metre-wide container carriers.

## Operational guidance

The crew of the container vessel must be given the means to operate the vessel safely and arrive in port with the cargo intact. Weather routing is an important part of this as well as an understanding of the forces involved resulting from the motions of the ship. The crew must be trained to recognise parametric roll and other dangerous situations. The crew must also be trained to select the best heading and speed for certain weather conditions.

One of the problems with modern container ships is that they are so large (length: 400 metres, beam: 61.5 metres and draught: 16.5 metres, capacity: 23,792 TEU) that the person in command does not have a "feel" for the ship anymore. The crew are used to smaller vessels and now the vessels are twice as big.

The present lashing equipment and procedures are apparently not up to expectations as container carriers continue to lose containers at sea and in bad weather. The working groups also have the ambition to investigate all container incidents at sea in order to come to conclusions of what went wrong.

## Legislation

The IMO have released a number of publications like:

- Code of Safe Practice for Cargo Stowage and Securing (CSS Code).
- CTU Code – IMO/ILO/UNECE Code of Practice for Packing of Cargo Transport Units.
- MSC.1/Circular.1353/Rev.1 – Revised Guidelines for the Preparation of the Cargo Securing Manual.

This is part of the responsibility of the flag state to approve and enforce. Unfortunately, most flag states have few or no technical personnel so this "IMO package" is often subcontracted to the classification society.

The classification companies in turn have their own technical rules like (in this case Lloyd's Register has been used as an example):

- Special class notation for container securing arrangements.
- Rules for cargo securing arrangements including shipping containers.
- Rules for ergonomic container lashing.

The various classification societies all have different rules on this matter and they do not always lead to the same result. One of the difficulties in this matter is that the classification societies are commercial organisations and compete with each other on price and services. Harmonising the system will be to the benefit of all involved.

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# METSTRADE NOT TOO MUCH AFFECTED BY PANDEMIC

**The trade exhibition Metstrade 2021 for marine equipment, materials and systems brought 11,936 industry professionals to Amsterdam. Due to the health situation in the world, the show served a wider audience by a virtual platform and a TV channel. The show itself assembled 1105 exhibitors from 44 countries and the visitors spanned 63 nationalities.**

More than 200 marine equipment companies and boat builders entered the thirtieth anniversary edition of the Dame Awards and the seventh annual Boat Builder Awards, co-organised with International Boat Industry (IBI) in association with Raymarine. Eleven companies and two marine professionals were named winners with another 25 companies honoured in runners-up commendations.

## Dame Awards

Among the Dame Awards winners were Volvo Penta Assisted Docking, which uses an Electronic Vessel Control system and integrated Dynamic Positioning System to provide manoeuvring ability. If the person at the helm needs more time to think, they can take their hand off the joystick and the boat holds its precise position until the control is touched again.

The ResQLink View RLS Personal Locator Beacon of ACR Electronics incorporates Galileo's new GNSS Return Link alerting technology to provide an indication of distress receipt and rescue action.

The Mastervolt Lithium Ion Ultra 1250 by Advanced Systems Group EMEA is a smaller and lighter lithium ion battery than equivalent conventional cells, nominally rated at 100 Ah and available in 12 and 24 V versions. An integrated battery switch automatically disconnects cells if problems arise with temperature, charge current and other factors.

The two-litre AVD Fire Extinguisher by Sea-Fire Europe contains an Aqueous Vermiculite Dispersion agent to tackle the thermal runaway of lithium battery fires. Hence, it is becoming increasingly essential on board electric and hybrid boats.

## Boat Builders

Some winners and honourable mentions of the Boat Builders Awards were the Excess 15 hybrid power system by Excess Catamarans, Torqeedo and ZF, the integrated selective catalytic reduction (SCR) exhaust systems by Azimut|Benetti Group, Mive Eco and Hug Engineering, the Benetti B.Yond hybrid power system and emission reduction filters by Benetti Yachts, Siemens and MAN, the Princess Experience series by Princess Yachts, Sunreef Yachts Eco, and Zero-waste to landfill initiatives by Brunswick Corporation. A Lifetime Achievement Award was for Leon Slikkers, Founder of Slickcraft, S2, Tiara and Pursuit.

## Metstrade TV

Metstrade has a tradition of seminars and round tables with experts in their field. However, the content was not available for wider ac-

*Photo: 11,936 industry professionals visited Metstrade in Amsterdam from 16 to 18 November (pictures by Metstrade).*

cess. That changed this year with Metstrade TV. The channel delivered nine hours of presentations and debates, spanning market, technical and environmental issues.
Speakers were Johan Inden, President of Volvo Penta Marine Business Unit and Anders Kurtén, CEO, owner and director of Baltic Yachts in Finland.
In the Sustainability Session, some experts spoke about clean hulls. We mention Darren Jones, Strategy and Engagement Director of Sonihull-NRG Marine, supplier of ultrasonic antifouling systems. In 2020, he became Chair of the GIA Taskforce for the IMO GloFouling Partnerships Project.
Julian Hunter worked in the coatings and chemicals industry before joining Icomia. During his time at AkzoNobel, he was active in IMO and its committees deliberating on antifouling paints and biofouling.
Hans Slegtenhorst works in the coatings industry and has spent the last fifteen years specialising in yacht coatings for AkzoNobel. He has been involved in the product development and application parameters of some international marine coating brands.
John Alonso entered IMO in 2011 and joined the GloBallast Partnerships Programme, a capacity-building programme assisting developing countries to reduce the transfer of harmful aquatic organisms. The last three years, he was part of the IMO team that led the design of the GloFouling Partnerships Project, an international collaboration between the Global Environment Facility (GEF), the United Nations Development Programme (UNDP) and IMO to address marine biofouling.

## Marine power trains

Another Sustainability Session spoke about marine power trains and alternative fuels. Here, we heard Christoph Ballinn, co-founder of Torqeedo, and as Managing Partner engaged with artificial intelligence startup Oscar Navigation and as an advisory board member with electric boating startup iOX mobility.
Jacopo Molinari works at Fincantieri Yachts and is an expert in safety regulations, propulsion and auxiliary systems and heating, ventilation and air conditioning (HVAC). He has been part of the industry working group that helped develop the Red Ensign Passenger Yacht Code and he represents Fincantieri in the SYBAss sustainability committee and in the YETI (Yacht Environmental Transparency Index) working group, an inter-industry group.
Bram Jongepier works at Feadship. He took part in industry initiatives dealing with amongst others glass, Tier III integration, MLC translation into LY3 and other code developments.
Enrico Della Valentina is Team Leader of the MARIN Yacht Division. The research institute provides independent hydrodynamic and systems consultancy to shipyards, design offices and yacht owners.
Metstrade 2022 will be held from 15-17 November in the RAI in Amsterdam.

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*Digital helps, but people need to see and feel.*

# INTEGRATING IMDG AND LOADING AND STABILITY SOFTWARE

**Quite some safety-related aspects are traditionally included in ship loading software, such as stability, damage stability, longitudinal strength and line of sight. In 2004, this set was extended with provisions for the carriage of dangerous goods in packaged form in the International Maritime Dangerous Goods (IMDG) Code. For the verification of a loading condition with containers carrying dangerous substances against this Code, usually separate tools are applied, such as stand-alone software or paper-based procedures. Two manufacturers of dedicated software packages have worked together to create an integrated tool that covers all mentioned aspects.**

One partner is Exis Technologies, a UK-based global supplier of systems for the management of dangerous goods in sea transport. A key product of Exis is the Hazcheck system, which includes the full IMDG database with all requirements concerning packaging, stowage and segregation. Such an externally supplied database offers the advantage of being filled and scrutinised by professionals, with a strong commitment to keeping the database up to date. This is demonstrated by the fact that the most recent IMDG 40-20 amendment, which becomes mandatory in June 2022, is now already available at Exis. A nice feature of Hazcheck is its ability to act as a background server, which enables seamless integration with on-board loading and stability software.

Locopias is a state-of-the-art loading computer, manufactured by SARC, Bussum, the Netherlands. Since its conceivement in the mid 1990s, it has been installed on more than 1500 ships of various types, such as container, RoRo, naval, dry cargo, tanker, inland waterway, pipe laying and offshore construction and crane vessels. Locopias has always been equipped with a dedicated container graphical user interface (GUI) with support for a wide range of standard container types. However, corresponding container slot positions needed to be pre-defined for all container types, which was quite a task to do. Recently, a completely redesigned and rewritten container module was released, equipped with enhanced logic for the positioning of containers of varying sizes. This new module requires only a minimal amount of predefined data, while still supporting all ISO container types, even those not foreseen in the design stage of the ship.

The redesign of this module also offered the opportunity to extend the vessel's geometric data set with IMDG-related items, such as the locations of living quarters and ventilation inlets. In collaboration with the Hazcheck database, this allows for an automated verification of a container load against the IMDG Code, including checks on individual container placement and segregations between multiple containers.

*Container loading module in Locopias.*

Locopias can be installed as a shipborne software program, where relevant connected to the tank gauging system. In addition, Locopias copies are allowed to be used in shore offices as well, with the ability to transfer loading conditions, including IMDG particulars, to and from the ship. Data exchange with other computer systems is supported by the Electronic Data Interchange file (EDI/Baplie) importer and exporter.

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GERRIT J. DE BOER

## Laverend de oorlog door

**De Landelijke Vereniging tot Behoud van het Historisch Bedrijfsvaartuig (LVBHB) heeft een mooi uitgevoerde uitgave samengesteld met verhalen over binnenvaartschippers, schepen en scheepsbouw in de Tweede Wereldoorlog.**


Eeuwenlang was Nederland afhankelijk van vervoer over water dat in de negentiende en twintigste eeuw werd overgenomen door wegtransport en de spoorwegen. Tijdens de Tweede Wereldoorlog werd het vervoer over water weer belangrijk omdat het over land steeds moeilijker werd. Veel binnenvaartschepen werden door de Duitsers gevorderd of in beslag genomen om te worden omgebouwd tot landingsvaartuigen voor de geplande invasie van Engeland, Operatie Seelöwe. Later zijn ook schepen in beslag genomen voor het vervoer van materialen voor de Duitse oorlogsindustrie of geroofde goederen af te voeren naar Duitsland. In het laatste oorlogsjaar was het westen van Nederland voor de bevoorrading vrijwel geheel aangewezen op de binnenvaart.
De rol van de binnenvaart en de inspanningen die de schippers en hun families hebben geleverd was tot heden nauwelijks beschreven. Veel mensen waren bereid hun herinneringen op schrift te stellen en dat beschikbaar te stellen voor dit boek. Hun verhalen werden verzameld en geredigeerd door George Snijder en Mirjam Peil. Het boek is een waardevolle bijdrage om de herinnering aan de Tweede Wereldoorlog levend te houden, zeker voor de slachtoffers en de mensen die geleden hebben onder het oorlogsgeweld, maar ook al diegenen die zich hebben ingezet voor anderen. In tien hoofdstukken is per onderwerp een overzicht gegeven van de periode voor, tijdens en na de oorlog. In het eerste hoofdstuk is de Nederlandse scheepsbouw voor en tijdens WOII beschreven waarbij ook de verenigde scheepsbouwers aan de orde komen. Hier wordt door Gerbrand Moeyes nog melding gemaakt dat met een subsidie van het tijdschrift Het Schip, een voorloper van SWZ|Maritime, in 1924 een kantoor kon worden betrokken tegenover station Blaak in Rotterdam dat tijdens het Duitse bombardement van 14 mei 1940 verloren is gegaan. Het boek is geïllustreerd met veel niet eerder gepubliceerde foto's uit privé-archieven. Als afsluiting is voor referentie een schepenlijst, een overzicht van oude gerestaureerde binnenvaartschepen, varend erfgoed, met brandmerk en meetbriefnummer opgenomen.
*Laverend de oorlog door, formaat 25 x 20 cm, 288 pagina's, afbeeldingen, tabellen, Het Historisch Bedrijfsvaartuig, ISBN 9789082295825, prijs € 19,95, info www.lvbhb.nl*

## Astronavigatie – Van Columbus tot Willem Barentsz voor de moderne zeiler

**Poolshoogte nemen, dat was voor de zestiende-eeuwse zeeman: je positie bepalen. Wat kan de moderne zeiler met deze technieken?**

Precies vijf eeuwen geleden verschenen de eerste handboeken over astronavigatie waarin werd omschreven hoe je aan de hoogte van de zon en de Poolster kon vinden waar je was en welke koers je moest varen om een veilige haven te bereiken. Het zijn technieken die door de eeuwen heen hun waarde hebben bewezen. De fervente zeezeilers Siebren van der Werf (1942), natuurkundige, en Dick Huges (1944), klinisch longarts, en beiden gepensioneerd, laten in dit naslagwerk dezelfde navigatietechnieken herleven, maar nu toegesneden op de moderne zeiler die de beschikking heeft over een sextant en een betrouwbare chronometer (klokje). Verder zijn er moderne declinatietafels voor vier jaar (2021-2024) voor de hele aarde opgenomen, evenals tafels die de tijd geven voor de daglichtperiode tussen zonsopkomst en -ondergang en het Regiment van de Poolster. Daarmee is de lengtegraad te bepalen, iets dat in de zestiende eeuw nog niet mogelijk was. Van dit informatieve boekje is ook een Engelse en Duitse editie uitgebracht.
*Astronavigatie, formaat 12,5 x 20,5 cm, afbeeldingen, 96 pagina's, ISBN 9789086161591, prijs € 14,95 / Astronavigation – From Columbus to William Barentsz for the modern yachtsman, ISBN 9789086163427 / Astronavigation – Von Kolumbus bis Willem Barentsz für den modernen Segler, ISBN 9789086163434, Uitgeverij Lanasta, Odoorn info www.lanasta.eu*

# ZERO VISIBILITY QUICKLY IMPERILS ORIENTATION

## Mariners' Alerting and Reporting Scheme

### Allision with bridge support: Mars 202153

*As edited from NTSB (USA) report MAR 09/01*

In the early morning hours, a pilot had embarked on a berthed container vessel and was tuning one of the radars prior to departure. He was not satisfied with the results and told the master that, due to the degraded visibility and the poor radar performance, the departure would probably be delayed. He continued to tune the radar with the assistance of the vessel's master and officer of the watch (OOW). He inquired via VHF radio to both harbour traffic control and other vessels as to the visibility further out in the harbour. From all reports, it was very low at about 0.25 nm.

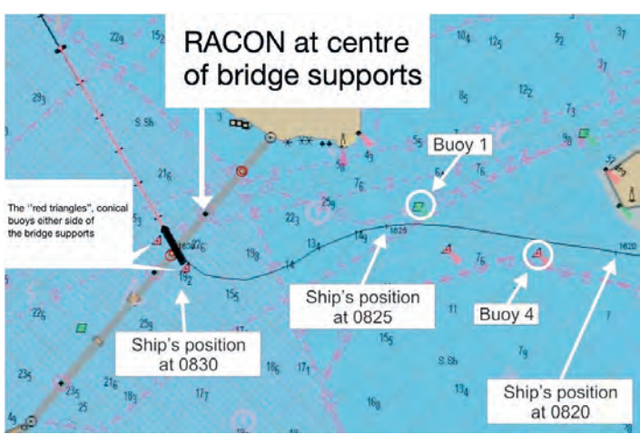
The pilot's plan to exit the harbour was to use parallel indexing to pass under the bridge and between two of the bridge supports. This was the main shipping channel and the supports were about 670 metres apart, a large gap that was not technically difficult to navigate and marked at mid-section with a radar beacon (RACON). However, the pilot did not inform the bridge team of his parallel index specifications. Neither did he request that his outbound courses, and specifically the course through the bridge supports, be put on the vessel's electronic chart. The crew had indicated an outbound course on the paper chart, but the pilot did not appear to have validated this. Neither the master nor the OOW inquired about the pilot's navigation plan.

At the point of departure, with visibility still very poor, the master commented: 'The fog is so heavy'. The pilot seemed satisfied with the radar, and his response to the master's comment was: 'Single up if you want...' The master agreed and departure was started. A tug was used to assist the stern away from the berth and then assigned to follow with slack line from the stern fairlead. By 08:06, the vessel was underway. At one point, the vessel's speed was increased from slow to half ahead at the pilot's request, giving a speed near 10 knots against a flood tidal current of about one knot.

A turn to port was initiated using 10 degrees of port rudder. The vessel soon reached the Variable Range Marker (VRM) ring set at the distance for the parallel index course through the bridge supports. But the pilot seemed to think the radar image of the bridge was distorted, so he turned to the electronic chart. Looking at the screen, he asked the master what the red triangles on the electronic chart represented. The master responded: 'This is on the bridge'. In fact, the red triangles were simply a representation of the two red conical buoys either side of the bridge support, a fact with which the pilot should have been familiar. Meanwhile, the helm was still 10 degrees to port and the helmsman reminded the pilot of this fact. The pilot acknowledged the reminder and, some forty seconds later, asked for midships.

Shortly afterwards, the pilot ordered 10 degrees starboard rudder, then 20, and asked for full ahead. According to the Voyage

**Editor's note:** The official investigation found, among others, that the pilot suffered degraded cognitive performance due to the number of medications he was taking. This would have probably affected his ability to interpret data, thus degrading his ability to safely pilot the ship under the prevailing conditions. While this may be possible, it is also possible that complacency and thick fog combined into a formidable trap. A loss of spatial orientation, such as that experienced by aviators who neglect their instruments, is certainly a possibility even without degraded cognitive performance. The next case study is a good example of this. But, irrespective of the immediate cause, single point failure was a major contributor to this accident. Had the pilot's plan been shared with the bridge team, especially the parallel index specifications – and had the pilot's departure courses been applied to the electronic chart – the chances of the vessel hitting the bridge support would have been much smaller. Hence lesson learned number one above. Better yet, had the departure been postponed until better visibility, the accident would surely have been avoided; lesson learned number two.




*The vessel's track before hitting the bridge support.*

Data Recorder (VDR) capture of the ship's radar display at this moment, the ship's heading was 241° (almost parallel with the bridge) and its course over ground was 255°. About this time, when the vessel was 0.3 nm from the bridge, a port vessel traffic services (VTS) operator was concerned that the vessel was out of position to make an approach under the bridge. He called the pilot, addressing him by his pilot designator name, "Romeo", instead of the vessel's name, as was the practice in this port. When the VTS call came, the pilot asked the helmsman to ease to 10° starboard. Once the conversation with VTS was finished, some 25 seconds later, the pilot requested starboard 20° helm once again. Pointing to a place on the electronic chart, the pilot asked the bridge crew: 'This is the centre of the bridge, right?' The master responded yes, and soon afterward the pilot requested hard starboard.

Over the next two minutes, the pilot gave rudder orders of hard starboard, mid-ships, starboard 20°, and hard starboard. At 08:29, the crew posted at the bow reported the bridge column close to port. About ten seconds later, the pilot ordered the rudder mid-ships and then hard port rudder. An allision was now inevitable and the pilot wanted to reduce the swing of the stern towards the bridge support.

The forward port side of the vessel struck the corner of the fendering system at the base of the bridge support at 08:30. The bridge support was unaffected due to the fendering and cement pier skirt, but the vessel suffered a large gash. Fuel tanks were punctured, causing pollution. The vessel was subsequently brought to anchorage to allow time to assess the situation.

**Lessons learned**

- A shared plan where everyone on the bridge is working from the same basis means there is a chance of catching and correcting an error, if it happens.
- In this case, the master had some reservations about the departure, as his comment to the pilot testifies ('the fog is so heavy'). But he did not question the pilot's impetus to leave. If you are in charge, take charge.

## Ferry trip ends with U-turn into shore: Mars 202154

*As edited from TSB (Canada) report M04L0050*

In the early morning hours, a double-ended passenger/vehicle ferry was loaded and departed on its short run across a river. Visibility was reduced by fog to less than 30 metres, but the master, at the controls, was experienced in this run and the departure was kept to the schedule. Another officer was also on the bridge. Both radars were in use and both were set for relative motion display, which is an unstabilised, head-up presentation. This was the standard radar setup for this bridge team on this run as almost all navigation was done visually. No electronic chart system had been fitted on the ferry.

Once the vessel cleared the departure basin and passed the jetties, it quickly fell off to starboard into the river current setting approximately 075° at two knots (see below), but this was not visually apparent to the bridge team. However, the master and mate both noticed that the gyrocompass repeater heading was rapidly turning to the east.

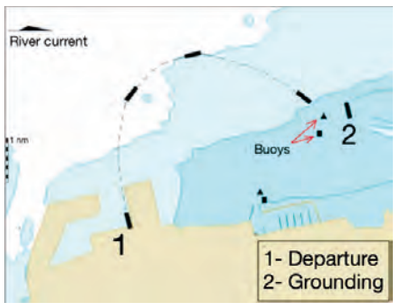
As the master and mate monitored the radars, both set on the 1.5 nautical mile scale, they saw the echoes of the nearby landmass quickly shifting, creating a blurred image. This was to be expected since the radars were set on unstabilised, head-up presentation. Nonetheless, the bridge team were now flustered and unable to quickly determine the vessel's position.

Without visual cues or an understanding of the blurred radar image, the master and mate looked to the GPS receiver to gain an appreciation of the vessel's speed. Soon, the lookout reported seeing buoys ahead. The master manoeuvred to avoid the buoys and, shortly thereafter, some ten minutes after departure, the vessel grounded. Later that morning, with the assistance of a tug, the ferry was refloated. No apparent damage was found and the ferry resumed service later that day.

The official report notes that 'the bridge team was essentially trained and experienced in visual navigation, but undertook a blind pilotage voyage.'

**Lessons learned**

- Blind pilotage not only requires proper training, but practice too. Practise your blind pilotage technique whenever possible, especially in good weather.
- A north-up, stabilised radar setup is superior to an unstabilised setting when navigating in low visibility conditions.




*The ferry grounded some ten minutes after departure.*

## Case study recap

In total, this Mars Report contains three case studies, the third of which will be published on our website, www.swzmaritime.nl. The three case studies have some remarkable differences, but also some striking similarities. In two of the three cases, an electronic chart was available, but not used effectively or could not display the vessel in an appropriate manner. Blind pilotage requires not only a detailed plan, but information inputs on the state and position of the vessel in real-time. And the detailed plan must be a shared plan, such that all of the bridge team have the same mental model of the passage plan and manoeuvre. What these case studies demonstrate is how quickly and definitively a person's spatial orientation and situational awareness can be compromised in near zero visibility if the proper information is not available or is not consulted. Finally, blind pilotage takes practice – best do this when the weather is good to hone your skills.

All Mars Reports are also published online, www.swzmaritime.nl.

# LEZINGENPROGRAMMA JANUARI

## Afdeling Rotterdam

Alhoewel de door de regering genomen maatregelen om de verspreiding van het coronavirus tegen te gaan voor drie weken zouden gelden, heeft het bestuur van de afdeling besloten om de lezing van 16 december *"Aspiration is inspiration, performance in practice of a wind-assisted propulsion system"* niet door te laten gaan. Deze lezing zou plaatsvinden in samenwerking met KIVI/Martec. Er heeft overleg met het bestuur van KIVI/Martec plaatsgevonden, waarbij door het KIVI naar voren is gebracht dat zij het elkaar ontmoeten voor, tijdens en na een fysieke lezing erg waardevol vinden. Een gedachte waar het bestuur van de afdeling het volledig mee eens is. Om die reden is besloten de gezamenlijke lezing naar het voorjaar te verschuiven, op een tijdstip dat de situatie in Nederland dat weer mogelijk maakt, en niet in plaats van de fysieke lezing een webinar te organiseren. Helaas was het te kort dag om voor deze avond nog een andere spreker te vinden. Wij hopen dat u met het bovenstaande kunt instemmen.

Wat betreft de lezingen voor de eerste maanden van het nieuwe jaar moeten we helaas constateren dat er nog niets te zeggen valt over de mogelijkheid voor het organiseren van een lezing op ons vaste adres, De Machinist. Niet elke spreker is bereid zijn lezing in de vorm van een webinar te presenteren. Wij zullen u zoveel mogelijk op de hoogte houden van de stand van zaken door middel van SWZ|Maritime, de website, nieuwsbrieven en uiteraard onze sociale media.

*Met vriendelijke groet, namens het bestuur, Wim Veldhuyzen, voorzitter afdeling Rotterdam*

## Afdeling Amsterdam

**Wednesday January 19th, 7:30 PM CET**
**Webinar: The art of transportation engineering**

*Speaker: Mr A.J. (Ton) Bos MSc. MBA Eur. Ing.*

*This lecture will be given in English.*

Ever since the start of offshore oil and gas and nowadays offshore wind exploration, the need for offshore constructions and infrastructure has been increasing in number, size and complexity. Topsides, monopiles, jackets, jack-up rigs, TLPs, spar buoys and FPSOs are designed for specific offshore operations and conditions. To enable these structures weighing up to 50,000 metric tonnes to be installed and commissioned, safe loading, transport and offloading operations are required. During this lecture, speaker Ton Bos will go into the most important aspects of transporting these offshore giants. In addition to the technical content, the rules and regulations important to warranty surveyors on transport jobs will be explained. The lecture will refer to DNV rules and regulations in addition to practical business cases.

The lecture helps to gain understanding of factors influencing structures during ocean transport and introduces the participant to the world of marine warranty surveyors. They can learn about different modes of ocean transport and the pros and cons of all types of operations. The ins and outs of the life of a surveyor and superintendent will be addressed to learn to navigate the demands of ships' captains.

The webinar will be recorded. After the presentation, there will be a half hour for Q&A. To register, please use the link on the KNVTS website agenda (coming soon).

*Binnen de minor Equipment Maintenance Technology werken studenten in groepen aan een actuele onderzoeksvraag vanuit het beroepenveld.*

## Afdeling Zeeland

**Onderwerp: Onderzoeksresultaten onderhoudsmanagement**
**Donderdag 20 januari**

*Sprekers: Studenten HZ minor EMT*

Bij de HZ volgen hbo-studenten van de opleidingen Marof, (Civil) Engineering en TBK een minor Equipment Maintenance Technology (EMT). Binnen deze minor doen de studenten een dag per week (twintig procent van de studietijd), in een groep van twee à drie studenten, onderzoek in projectvorm, waarbij ze proberen een actuele onderzoeksvraag vanuit het beroepenveld te beantwoorden.

De onderzoeksprojecten zijn in september gestart en zullen in januari 2022 afgerond worden. Dit jaar onderzoeken de studenten de volgende onderwerpen:

- Data-analyse toestand sluisdeur met behulp van V-t diagrammen (Rijkswaterstaat).
- Voorspelbaar en preventief onderhoud van een tandwielkast (Damen).
- Verzamelen faaldata van een regelklep (Interreg).
- Verzamelen faaldata en voorspellen levensduur van hydraulische cilinders (Van Oord).
- Optimalisatie onderhoud riolering (Reimerswaal).

Ze willen hun resultaten graag presenteren aan de leden van de KNVTS. In overleg met de opleiding en de opdrachtgevers wordt een aantal studenten de gelegenheid geboden hun resultaten te presenteren.

Op het moment van drukken van het blad is nog niet bekend of de lezing fysiek of via Teams gehouden zal worden. Via de KNVTS-website wordt u hiervan op de hoogte gehouden.

## Afdeling Noord

Afdeling Noord heeft nog niet de informatie beschikbaar over de te organiseren lezing in januari 2022. Wij zullen u, indien bekend, nader informeren via de KNVTS-website.

# UITREIKING SCHILDERIJ VAN DE SENDO LINER

In 2019 was de winnaar van de KNVTS Schip van het Jaar-prijs het binnenvaartschip de Sendo Liner. Tijdens het Maritime Awards Gala (MAG) 2019 werd de wisselprijs – een houten scheepsmodel van de Duyfken – aan de vertegenwoordigers van de werf Concordia Damen uitgereikt. Als gevolg van corona ging het MAG 2020 niet door en is de wisselprijs nog een jaar langer bij de werf blijven staan. In oktober dit jaar is de wisselprijs opgehaald voor de prijsuitreiking van de KNVTS Schip van het Jaar-prijs 2021.
Op woensdag 17 november is bij de werf Concordia Damen te Werkendam de definitieve prijs – een schilderij van de Sendo Liner – uitgereikt aan de CEO Chris Kornet door KNVTS-hoofdbestuurslid Peter Wehrmeijer. Het schilderij is daarna door de werf gegund aan de rederij van de Sendo Liner, Sendo Shipping te Harderwijk, waar het een mooie plek heeft gekregen.

*Het schilderij van de Sendo Liner vervangt de wisselprijs.*

*Uitreiking aan Concordia Damen met van links naar rechts Chris Cornet, CEO, Peter Wehrmeijer, hoofdbestuurslid KNVTS, en John Kool, algemeen secretaris KNVTS.*

# VAN DE BESTUURSTAFEL

**Woensdag 24 november is het hoofdbestuur bijeengekomen om te komen tot een plan van aanpak voor het bestuursjaar 2021-2022. We hebben een bewogen tijd achter de rug. Corona heeft ons de afgelopen maanden veel gehinderd en we hebben daardoor helaas weinig fysieke bijenkomsten kunnen organiseren. Er was wel een zeer succesvolle bijeenkomst over het ontwerpen van schepen met *virtual reality*. Enkele dappere deelnemers namen de uitdaging aan om door het ontworpen schip, een ijsbreker, te wandelen.**

Verder zijn er diverse online webinars georganiseerd. Op het YouTube-kanaal van de KNVTS zijn alle opnames van de presentaties nog te zien.
Nadat het ledenbestand is opgeschoond, zien we dat het ledenbestand vrij constant blijft. Wel moeten we nog steeds een inspanning leveren om jongere leden aan ons te binden.
Helaas hebben we afgelopen jaar afscheid moeten nemen van drie hoofdbestuursleden omdat hun termijn erop zat. De algemeen secretaris is met ingang van augustus met pensioen, maar heeft nog wel de organisatie van de KNVTS Schip van het Jaar-prijs 2021 begeleid. Met ingang van 1 december heeft John Kool zijn werkzaamheden voor de KNVTS definitief beëindigd. Onze secretaresse Marijke van Zijl heeft aangegeven in maart 2022 met haar werkzaamheden voor de KNVTS te zullen stoppen. Er wordt hard gewerkt aan een nieuwe bezetting van het secretariaat.
Helaas is er een groep leden die niet tevreden is met het gevoerde beleid. Dit heeft geleid tot het aftreden van onze voorzitter en een bestuurslid. Wij bedanken hen voor hun inzet en bijdragen. Het hoofdbestuur heeft ondergetekende gekozen tot voorzitter en Willem Nugteren tot penningmeester. Verder mogen we Eric Schiphorst verwelkomen om het bestuur te versterken.
Een commissie Strategie zal voorstellen doen om de KNVTS te versterken en de instroom van jonge leden te bewerkstelligen. We zullen u natuurlijk op de hoogte houden van de plannen en resultaten.
We hebben onze blik op de toekomst gericht en zullen ons als hoofdbestuur met veel energie inzetten om de KNVTS verder te versterken en een belangrijke functie te behouden in onze maritieme wereld.
Ik wens alle KNVTS-leden prettige feestdagen en een gelukkig 2022 in goede gezondheid.
*Ton Bos, voorzitter KNVTS-hoofdbestuur*

**SWZ|Maritime** is onder meer het periodiek van de Koninklijke Nederlandse Vereniging vanTechnici op Scheepvaartgebied, opgericht in 1898. SWZ|Maritime verschijnt elfmaal per jaar. Het lidmaatschap van de KNVTS bedraagt € 88,00 per jaar, voor juniorleden € 39,00 per jaar, beide inclusief dit periodiek. Een digitaal lidmaatschap (alleen voor studenten) kost € 15,00 per jaar. Het geeft u de vooraankondigingen van de maandelijkse lezingen, te houden op vier verschillende plaatsen in Nederland en korting op verschillende activiteiten. U kunt zich opgeven als lid bij de algemeen secretaris van de KNVTS, Zeemansstraat 13, 3016 CN Rotterdam, e-mail: secretariaat@knvts.nl of via het aanmeldingsformulier op de website: www.knvts.nl.

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