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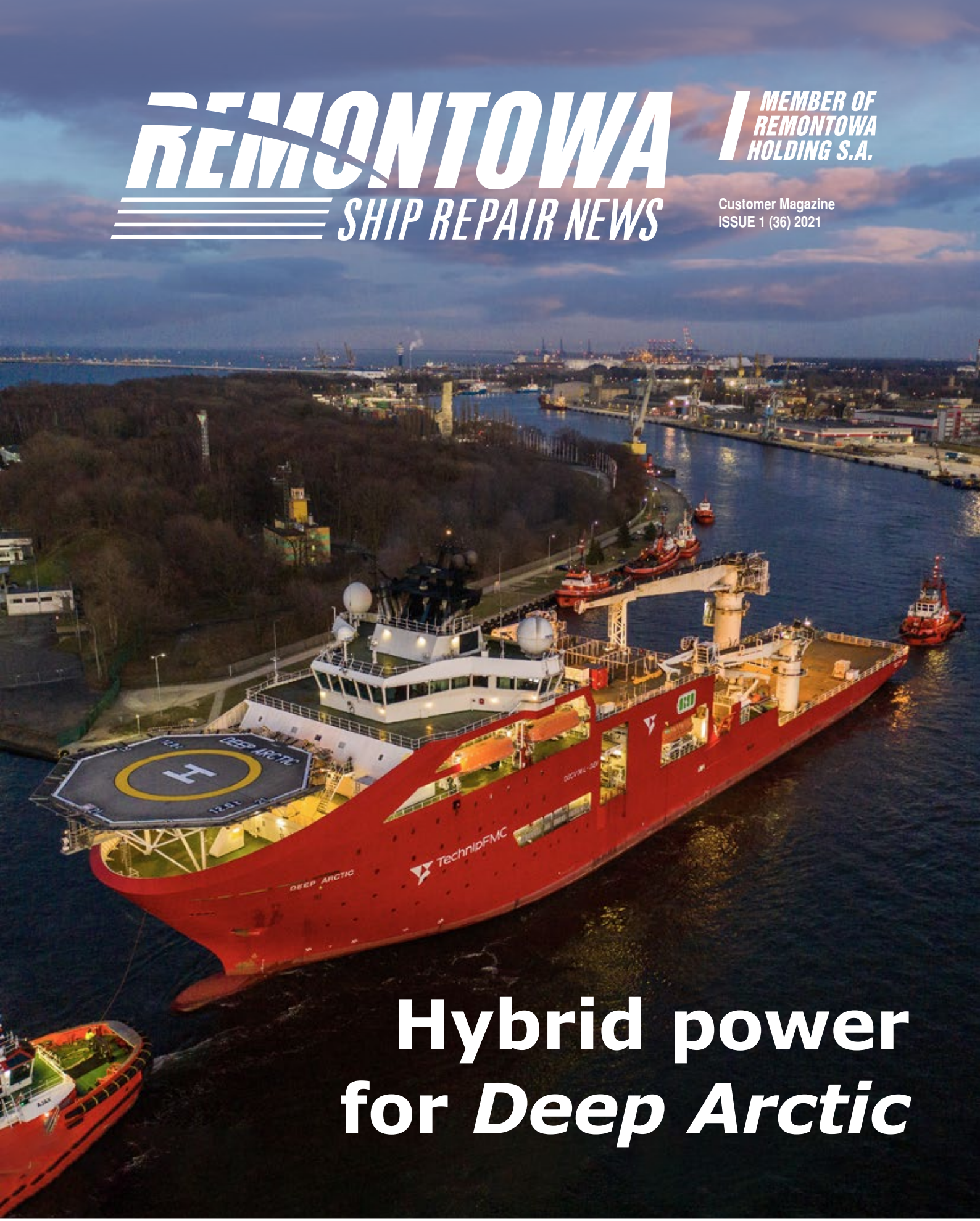

Hybrid power for *Deep Arctic*

in magazine

A shot of optimism

After a difficult 2020, dominated by the COVID-19 pandemic, the beginning of 2021 has brought some signs of optimism.

Still from the end of 2020 and from the beginning of 2021, ships of various types - bulk carriers, car carriers, Ro-Pax ferries, Ro-Ro ships, gas carriers, chemical tankers, dredgers, fishing vessels - have called at Remontowa.

The volume of ship repairs is growing, we are also carrying out some interesting conversions and modernisations of vessels working in the offshore sector, including offshore wind.

One of the most exciting projects, which began in 2020 and was completed in 1Q 2021 was the completion of the dredger Willem van Rubroeck, which was towed to us from Croatia as an unfinished newbuilding. The project consisted of more than two thousand intensive outfitting works, covering various systems of the dredger.

Shipowners also entrust us with conversions to increase the ships' energy efficiency. In March, we completed a project to equip the Deep Arctic Diving Support Vessel (followed by the Deep Star DSV) with a battery pack. This has made her one of the world's first battery-powered hybrid DSVs. Once the ship is converted, the new battery system improves propulsion efficiency while lowering fuel consumption, contributing to the reduction of harmful emissions into the atmosphere.

We have also been retrofitting more and more vessels with ballast water treatment systems. After a successful 2020 in this respect, in which we installed such systems on more than 30 ships, the first months of this year brought another inflow of such orders. We have been retrofitting ships of various types, including car carriers, self-unloading bulk carriers, Ro-Ro ships, Ro-Pax ferries and dredgers with a variety of ballast water treatment technologies. These orders often go hand in hand with the ship's special surveys and regular repairs. According to Clarksons Research, there are still more than 21,000 ships worldwide on which BWT systems need to be fitted, so... there is still a lot of work ahead!

But it's not the only good news. Remontowa Shiprepair Yard cares about people's safety. That is why - as one of the first large companies in Poland - in April we have implemented a vaccination programme against COVID-19 for our employees and contractors, including their families. We vaccinate because we want to avoid infections, but also because the health of our employees means the safety of the Shipowners who entrust us with their ships for repair, modernisation and conversion. We want you to feel even more safe with us.

That is why we would like to once again thank the Shipowners for their understanding and cooperation. Our work and projects carried out together with our Clients are like the best vaccine to keep their ships in good health allowing them to sail safely. We will continue to do our best to keep it that way.

Grzegorz Landowski
Communications Director
REMONTOWA HOLDING

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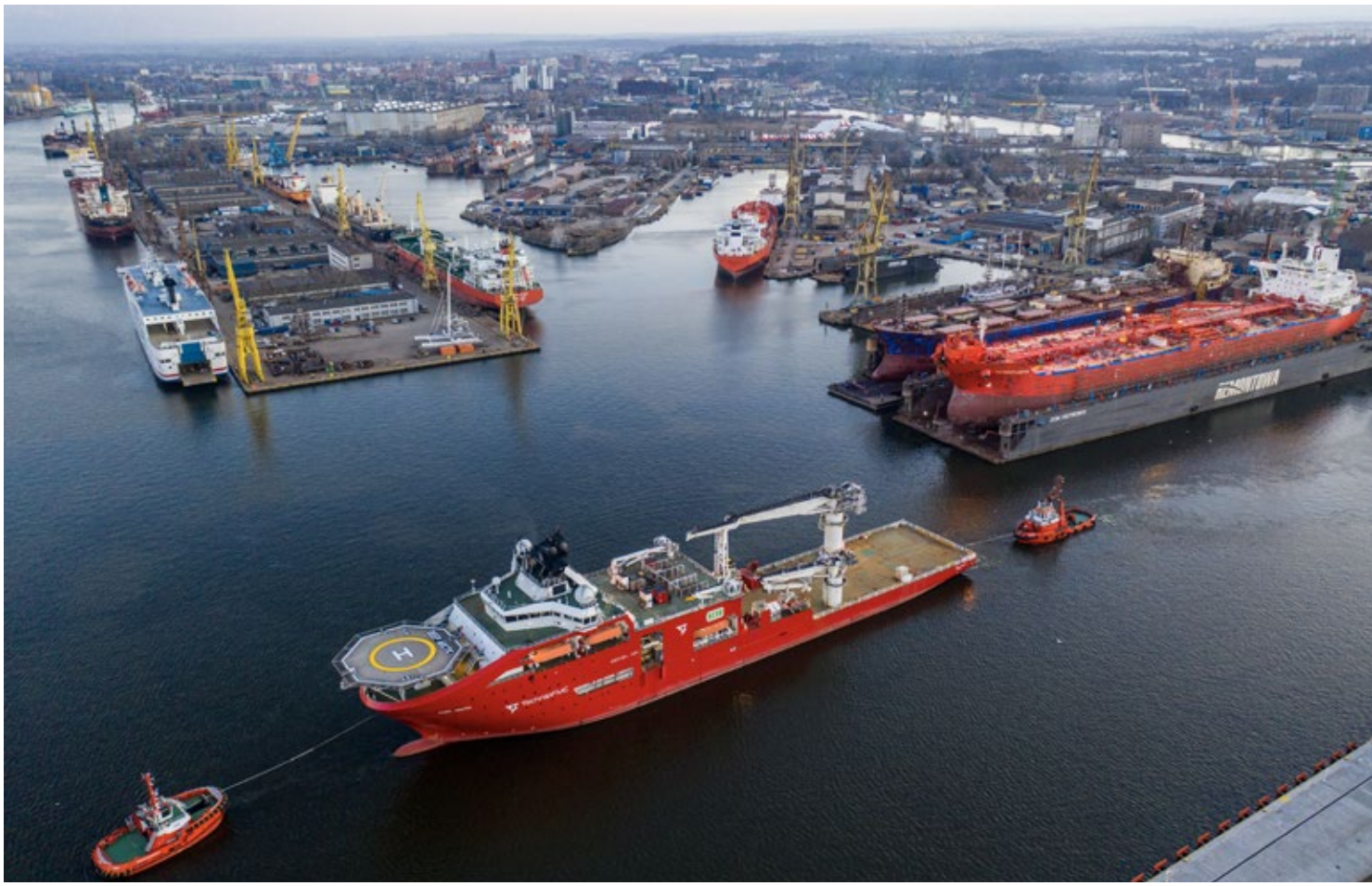


The *Deep Arctic* converted to be powered by a hybrid battery system leaving Remontowa.
Photo: Marcin Koszałka

The first DSV supported by batteries

Deep Arctic converted to hybrid power system!

In 1Q of 2021 one of the most interesting projects was that related to the conversion of the *Deep Arctic* DSV. In March, the ship left Remontowa equipped with an advanced battery hybrid power system.

Deep Arctic owned by TechnipFMC is one of the world's most advanced diving support and heavy construction vessels. She is designed for offshore construction as well as Inspection, Repair and Maintenance (IRM) services. Work on subsea installations, submarine cables and pipelines can be carried out both by divers and remotely operated vehicles (ROV) with the use of Launching And Recovery Systems (LARS).

Additionally, the vessel is ready for easy mounting of carousels/reels and Vertical Lay System (VLS) to install flexible risers and flowlines through the working moonpool.

The *Deep Arctic* is powered by six diesel engines, each driving a generator and providing a total output of 20.2 MW to the grid. The generators power the ship's propulsion – bow thrusters and forward retractable azimuth thrusters as well as aft thrusters and the propeller.

The 24-person saturation diving and decompression support complex, suitable for divers working at depths of up to 350

metres, includes the two three-person diving bells (with a capacity of 7.5 sqm each), the two six-person and the four three-person living chambers, as well as the two 18-person hyperbaric lifeboats.

The vessel is equipped with a DP 3 system and a Hyperbaric Monitoring and Control System (HMCS). The diving bells and two ROV heave compensated Launching And Recovery Systems can operate in wave heights up to 6 metres, making *Deep Arctic* one of the most versatile DSVs in the world. She can operate virtually all year round, almost anywhere in the world, including in the harsh environment and demanding sea and weather conditions of the North Sea.

At Remontowa the ship underwent conversion owing to which its existing engines have been supplemented with an advanced battery hybrid power system, that consists of the battery bank and auxiliary equipment. Once installed, the new battery system improves propulsion efficiency while lowering fuel consumption, contributing to the reduction of harmful emissions into the atmosphere.

The 1.2 MW battery system generates, as well as stores, additional energy to power both the thrusters and the ship's other systems when power demands increase, without having to turn up the operation of diesel engines, thus enabling peak shaving.

The battery system has a role to play in the ship's three primary modes of operation: transit mode, Dynamic Positioning mode and while stationary in port, when it supplies the ship's systems with externally drawn energy through a shore connection.

In the transit mode, the battery system provides ability to peak shave engine load allowing the engines to run at constant load thus maximising operational efficiency and fuel consumption whilst minimising engine wear. In the DP mode, the batteries provide supplementary power from a hybrid battery bank, allowing fewer engines to be running whilst ensuring the ship's position is maintained.

In case of the future proof shore power connection, the system enables zero-emission port operation whilst maintaining full utility of vessel services.

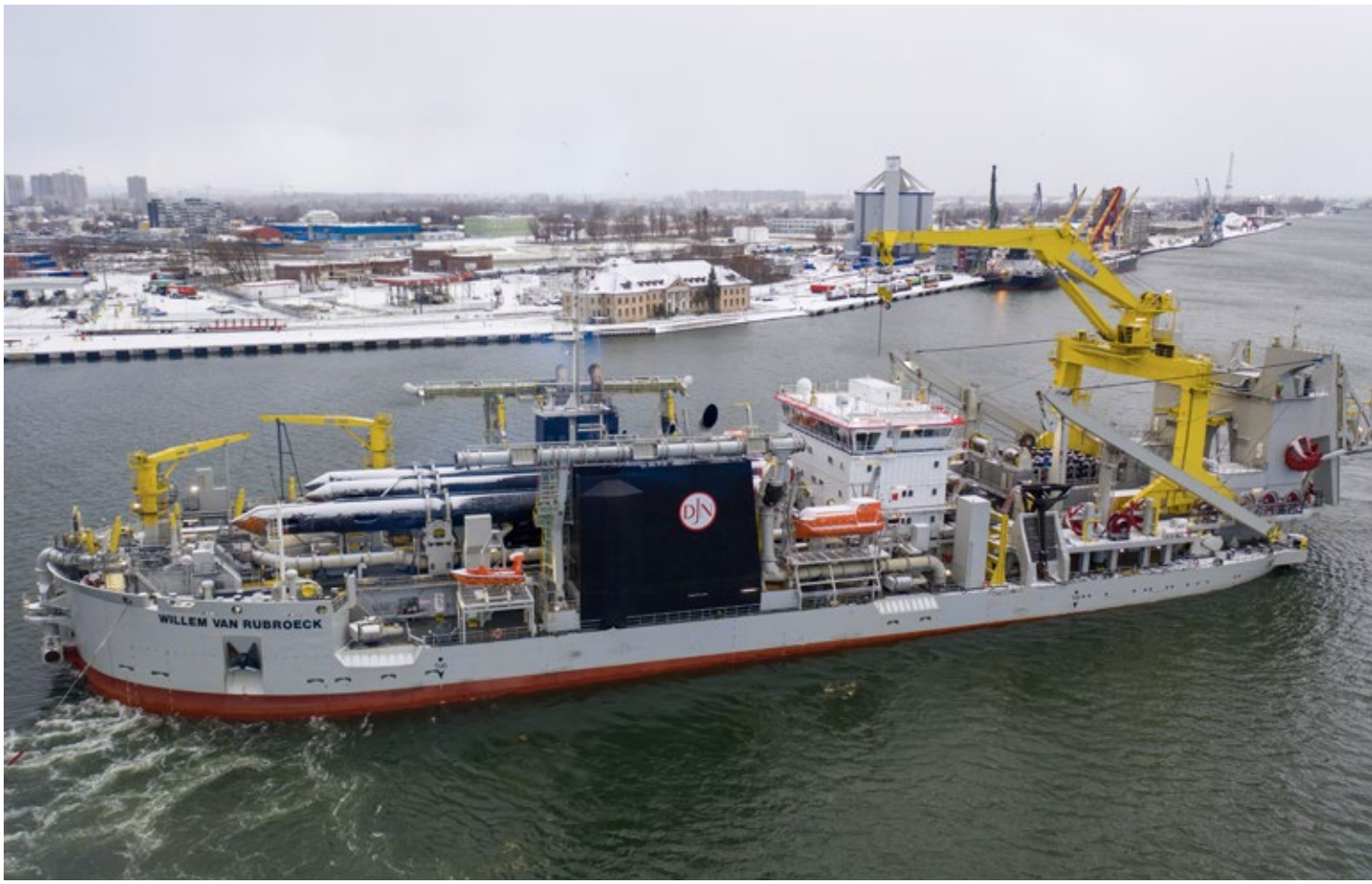
As a result, the ship's fuel consumption as well as SOx, NOx and CO2 emissions are reduced, improving efficiency and environmental credentials.

It is worth mentioning that at the end of the conversion, Eric Laing - Vessel HSE Superintendent at TechnipFMC - thanked, on behalf of the company, all employees involved in the offshore project for their good cooperation, including exemplary compliance with HSE rules. He also rewarded the two Polish employees who stood out the most in this regard.

When asked about the level of safety at work on this project, he said:

- I can only speak in superlatives. During the course of this project, there was no accident or incident that would have affected occupational safety. There was a professional approach to our duties by both the employees and the yard's management, who assisted us when necessary. There was an understanding of occupational safety on both sides. We formed a good team in this respect, which I am very pleased about - Eric Laing emphasised.

The second ship from the same Shipowner to enter the Remontowa shipyard for a similar conversion was the *Deep Star* construction support vessel (CSV).
Photo: Marcin Koszałka



The dredger *Willem van Rubroeck* fully completed by Remontowa while leaving the yard.
Photo: Marcin Koszałka

Willem van Rubroeck - arrived as unfinished newbuilding, sailed out as entirely completed dredger

Mighty ship

One of the most exciting projects, which began in 2020 and was completed in 1Q 2021 was the completion of the dredger Willem van Rubroeck, which was towed to Remontowa from a Croatian shipyard as the unfinished newbuilding. The project consisted of more than two thousand intensive outfitting works, covering various systems of the dredger.

In 2020, Dredging & Maritime Management SA (DMM) of the Jan De Nul Group was looking for a shipyard capable to complete the construction of the dredger. *Willem van Rubroeck* is described as the most powerful cutter suction dredger in the world featuring 40,975 kW.

Several competitors were applying for this contract, not only from Europe. Ultimately, the shipowner entrusted the task to the Remontowa Shiprepair Yard, which not only has vast expertise in carrying out technically complex marine engineering projects, but also guarantees comprehensive execution of work.

The shipyard's main task was to get the construction of the dredger done according to a detailed work specification prepared by the shipowner, and to carry out commissioning and testing of the equipment, acceptance tests and sea trials. The specification included more than 2,000 separate jobs of varying complexity and characteristics.

More than 30 per cent of the total scope consisted of steel replacements covering almost every area of the dredger. The accommodation part and wheelhouse (nav-

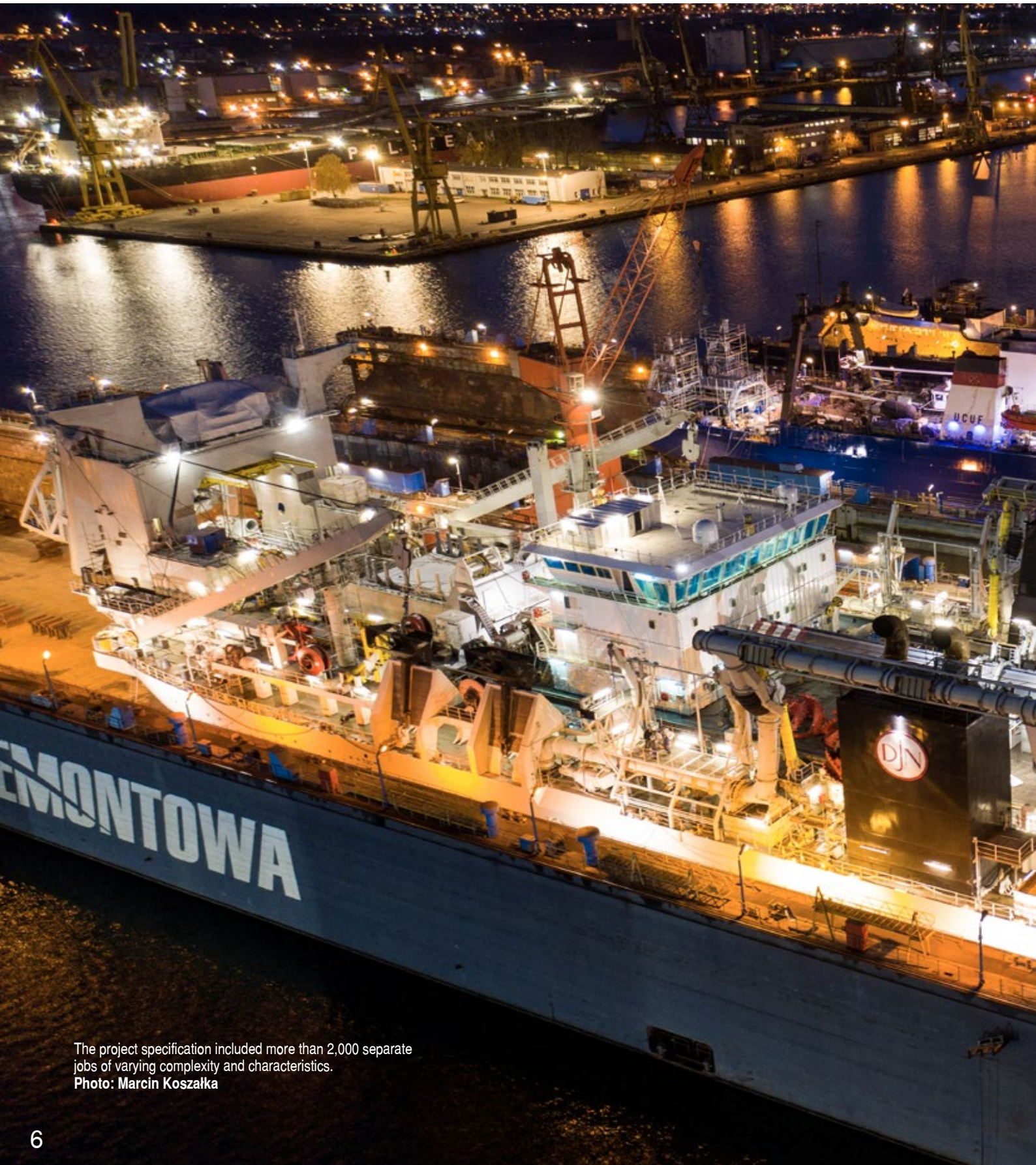
igation bridge) have entirely been outfitted, including mounting of insulation, ventilation, formwork and furniture.

Electricians carried out more than 200 jobs of varying scope. A total of nearly 30 km of electrical power and signal cables were laid, along with wiring.

In the final stage of the project, all areas of the ship specified by the owner - superstructure, hull, decks, equipment and piping - underwent comprehensive maintenance.

Paint coatings have been applied to virtually all areas of the dredger, from the ballast tanks and voids, through the fresh water tanks and engine room to the hull and outer decks.

The dredger's superstructure has been entirely outfitted. Most of time was spent on finishing the new accommodation part. The ship's systems were fitted with the missing insulation, the working decks were covered with wood. The ventilation, air-conditioning as well as radio-communication, navigation, fire protection, lighting and safety systems were completed, verified and put into operation.



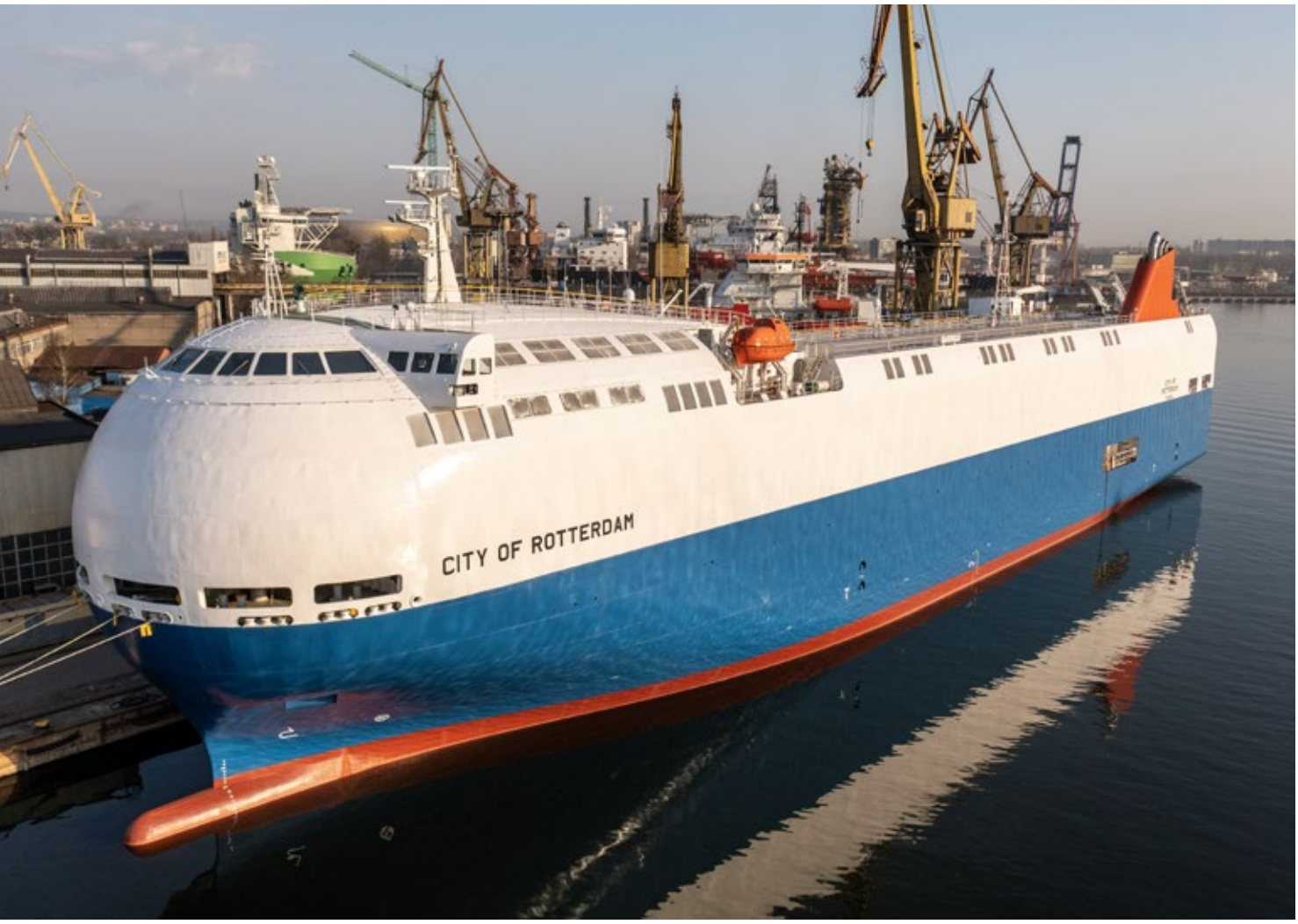
The project specification included more than 2,000 separate jobs of varying complexity and characteristics.
Photo: Marcin Koszałka

Steel replacements accounted for nearly 700 jobs of varying complexity, including work on the hull with plates up to 130mm thick. The largest job was the construction of a system for turning the dredger while in operation using anchors (tumbling sheaves).

A significant scope concerned the pipelines. The most complex task was installation of the two loading pipes, each weighing 92 tonnes and re-arrangement of the 1100 mm diameter dredging system pipes in the pump room as well as in the area of the cutter.

The most important and difficult challenge however was the work on the hydraulic system and that related to the dredging equipment. The entire hydraulic system, featuring the pipes up to 250 mm in diameter was tested and flushed. Due to its size and quantity, the winding of the wire ropes on the winches for the dredging systems was also a challenge.

The completely outfitted and tested dredger *Willem van Rubroeck* left Remontowa in February 2021.



City of Rotterdam was the second "floating Zeppelin" to call Remontowa in 2021.
Photo: Marcin Koszałka

Car carriers with renewed class and equipped with BWT systems

Climbers on „floating Zeppelins"

Among interesting ships that called at Remontowa in early 2021, it is worth noting the twin car carriers, distinguished by their unusual hull shape. Both ships belong to the Japanese shipowner MOL.

The car carriers *City of St. Petersburg* and *City of Rotterdam* with their streamlined hull shape and rounded bow, are similar to the "Zeppelin" airships known from history. The unusual shape of the bow, which is the vision of Japanese designers, is said to reduce air resistance by up to 50 per cent compared to conventional hulls, which in turn translates into lower fuel consumption.

The *City of St. Petersburg* called at Remontowa for a class renewal and a BWT system installation. The ship is currently operating between the Baltic and North Sea, transporting Nissan cars from its UK factory.

City of St. Petersburg has had a long history of repairs at Remontowa beginning in 2011. Another visit in 2013 followed her collision with a quay at the Gdansk harbour, which resulted in an emergen-

cy docking. In 2018, the ship underwent a dockside repair, including numerous inspections, maintenance and painting.

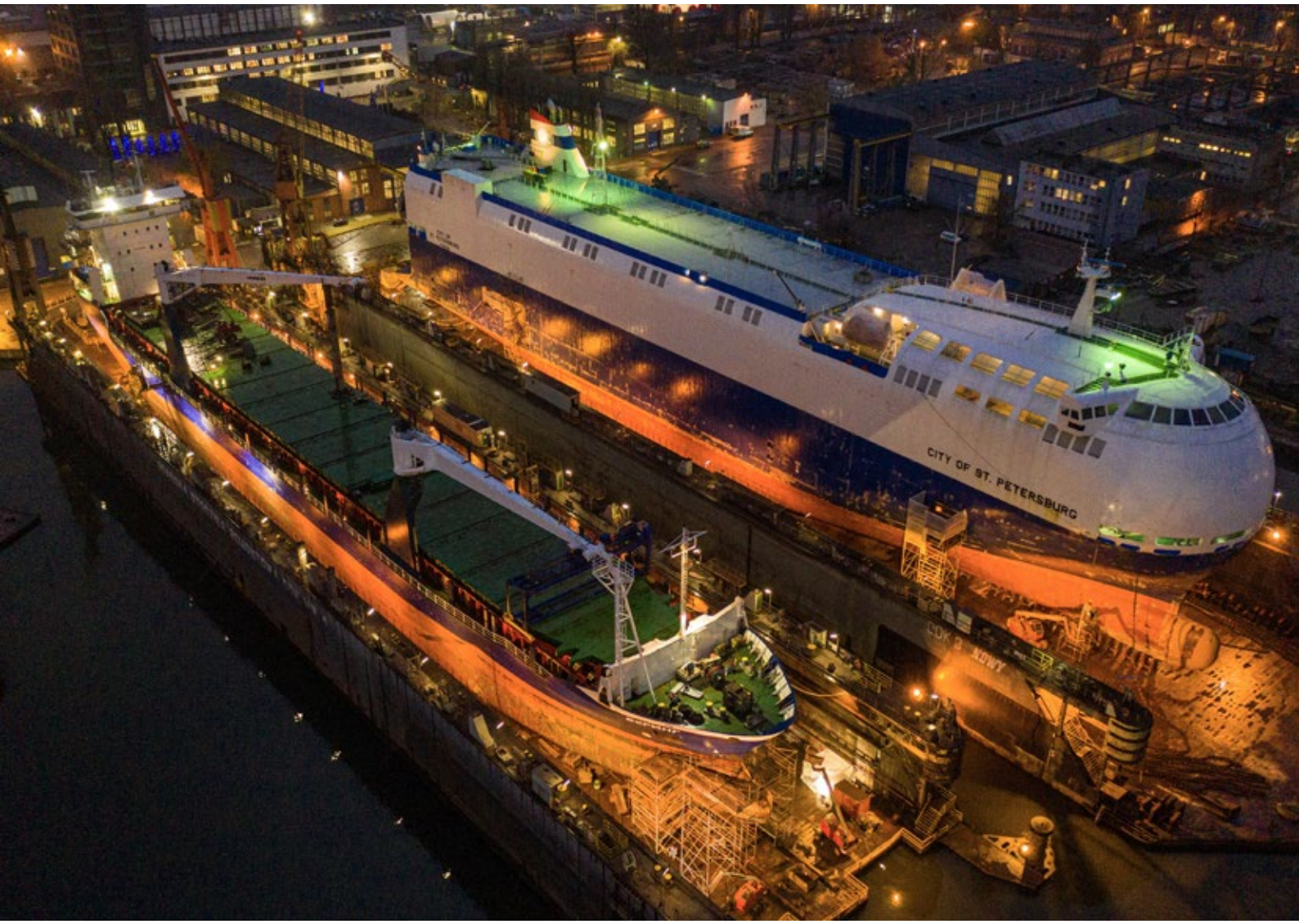
The reason for the most recent visit was an order for the installation of a BWT system. The ship has been retrofitted with the system supplied by Japanese company Miura, which purifies water using a combination of filters and UV light. In addition, the ship underwent a special survey. This included an overhaul of the outboard valves, inspection of shaft lines, repair of bow thruster and painting of the hull.

A few weeks after the repair of the *City of St. Petersburg* had been completed, another car carrier owned by MOL, *City of Rotterdam* called at Remontowa.

The purpose of her visit was also the installation of a BWT system and a special survey. As with *City of St. Petersburg*, the installation of the BWT system required prior preparation, installation of the foundations, prefabrication and laying of the ballast piping while making the relevant electrical connections.

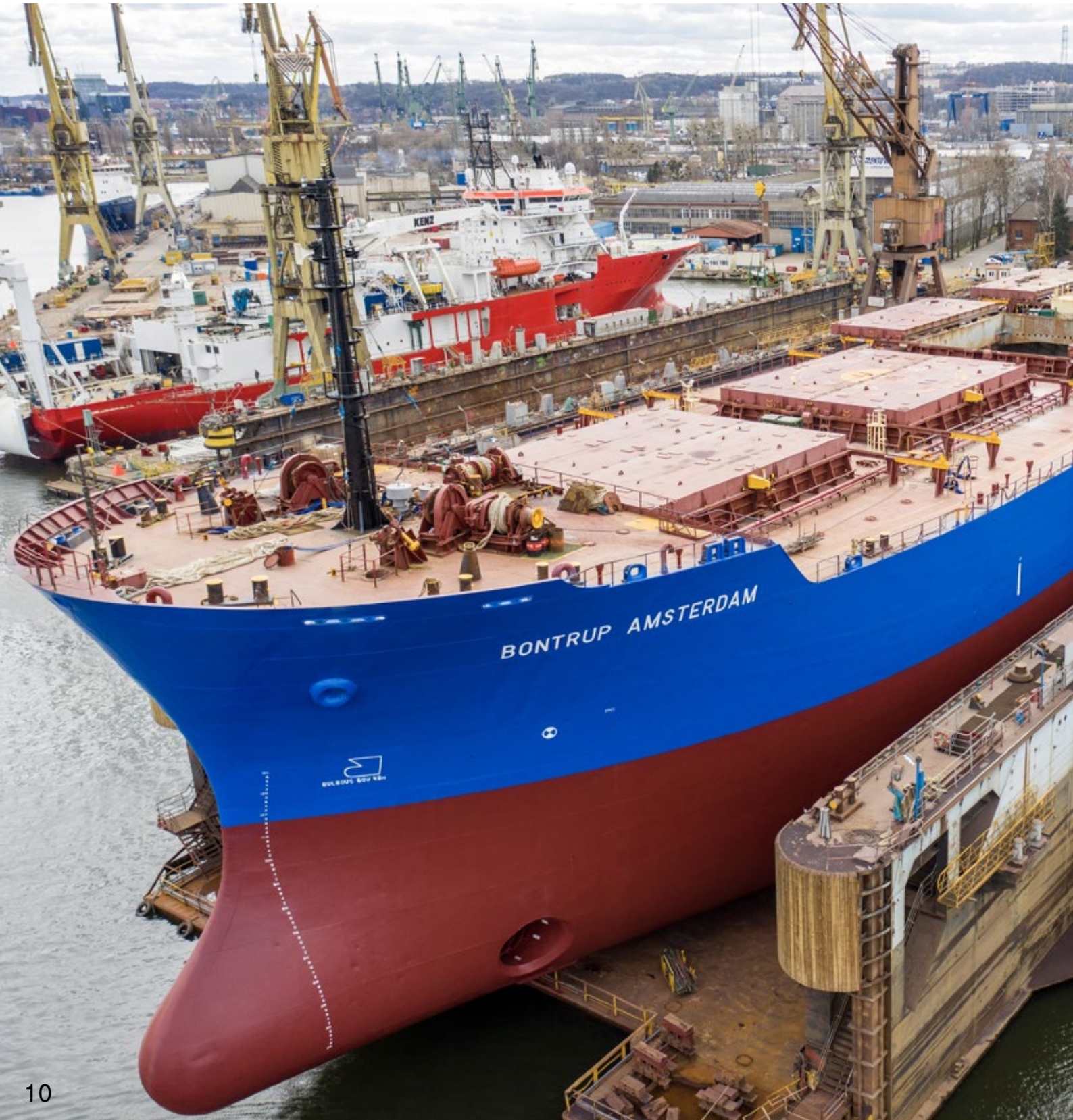
When the ship was in dock, the bow thruster was repaired and more than 30 electric motors of various kind were overhauled. The repair of the hydraulic cylinders of the stern ramp and the stern quarter ramp was also a critical element of the project. Furthermore, a comprehensive hull maintenance was carried out. The above-water section required the use of cranes and access baskets, whereas the work on the rounded section and the funnel was completed by a team of specialised climbers.

City of St. Petersburg (at the top) with her streamlined hull shape and rounded bow drydocked at Remontowa.
Photo: Marcin Koszałka

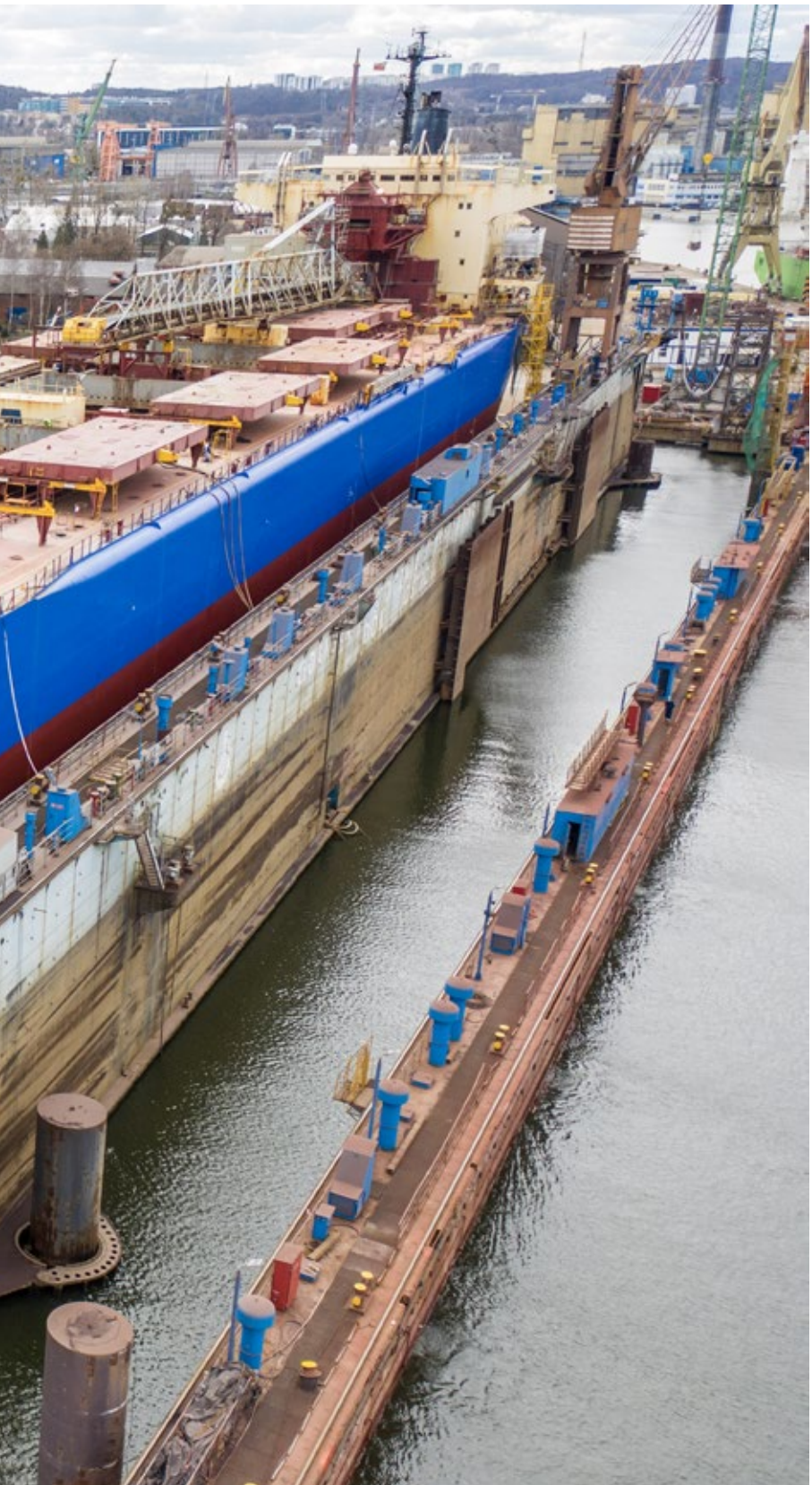


A second visit of one of the world's largest self-unloading bulk carriers

Bontrup Amsterdam with BWT system



Bontrup Amsterdam is associated with two other ships that have already been repaired many times in the Remontowa Shiprepair Yard: _Yeoman Bridge_ and _Yeoman Bontrup_.



Both Yeoman vessels, measuring almost 250 metres in length, belong to the largest self-discharging bulk carriers in the world. The ships are conspicuous by their characteristic red hull and superstructure. However, the main distinctive feature of the vessels is the conveyor system - a dozen metre long swinging boom equipped with a conveyor belt, placed in the ship's axis and used for self-loading and self-discharging operations.

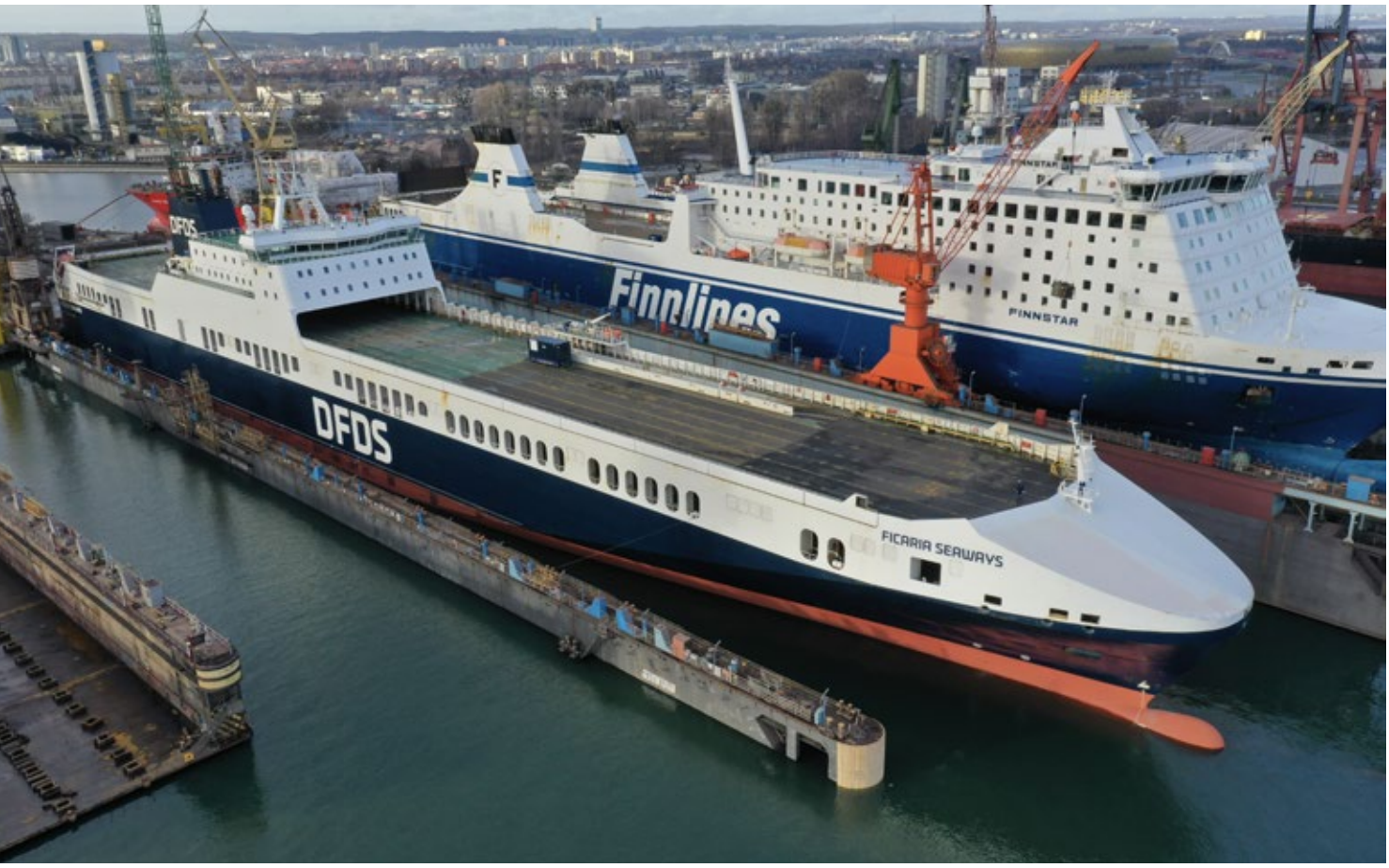
The *Bontrup Amsterdam*, whose hull is dominated by the colour blue is slightly smaller than the ships mentioned above. She is 224.40 m long. She has been part of SMT Shipping Ltd. fleet of nearly 60 ships for just under three years.

The ship was previously serviced at Remontowa two years ago. At that time, we fitted the self-discharging carrier with a stern thruster.

During her last visit in February 2021 the *Bontrup Amsterdam* was retrofitted with a BWT system supplied by the Greek company Erma First. This is an advanced modular system with capacities ranging from 50 to 3,000 m3/h, which main components are high-performance filters and a high-capacity electrolytic cell.

After extensive piping work and the BWTS installation, the new ballast pipe line measures several hundred running metres. While in dock, the bulk carrier also underwent standard inspections and maintenance with five tonnes of steel in the ship's hull plating replaced.

During her second visit to the Remontowa yard, *Bontrup Amsterdam* was fitted with a BWT system.
Photo: Marcin Koszałka



Ficaria Seaways while leaving the floating dock at Remontowa.
Photo: Marcin Koszałka

Class renewals, BWTS installations and more...

DFDS ships
make regular calls here

Over the last few years, Remontowa has equipped a large part of the DFDS fleet with scrubbers. Now we are retrofitting the Ro-Ro ships of this Shipowner with Ballast Water Treatment systems.

Athena Seaways entered the shipyard in December 2020. In fact it wasn't her first visit that year. The ship had previously been at Remontowa at the beginning of last year. At that time she underwent a comprehensive special survey, which included maintenance of the hull, superstructure, funnel and car decks, as well as work on the underwater part of the hull.

The project also involved: extensive repairs on the stern ramp, overhauling of mooring rollers, maintenance of two lifeboats and a "man overboard boat" (MOB), the inspection of oil pumps and electric fan motors as well as the replacement of steel in fresh water tanks.

In December 2020, during her second visit the propeller shaft seals were replaced with its blades repaired. The flow meters were installed on the fuel system of the main and auxiliary engine. It was a part of the installation of the ship's propulsion efficiency measurement system.

Another Ro-Ro DFDS ship at Remontowa was *Ficaria Seaways*. This was her fifth visit in the last 7 years.

The most important item in the schedule for this year's repair was the installation of a BWT system supplied by Desmi, which neutralises dangerous microorganisms in ballast water using UV lamps. The system was installed in a special, previously prefabricated deckhouse, mounted on the main deck on the port side of the ship.

In addition, the stern ramp flap hinges were replaced, the LP/HT cooling pumps and the scrubber pump were reconditioned. This was supplemented by maintenance of the hull.

The next Ro-Ro ferry - *Princess Seaways* - called at Remontowa in late January/early February for a special survey.

Along with a standard class renewal work, a large scope covered the piping in virtually every area of the ship. A lot of steel was replaced, especially in the chain lockers, on the stern ramp flap and in several areas of the main deck. The Shipowner also commissioned maintenance of the sewage treatment plant, decks and the hull.

While the ship was in dock, all propeller blades were dismantled and inspected. 3D scanning made it possible to assess precisely their technical condition and inspect all damage, even the one not visible on the outer layer.

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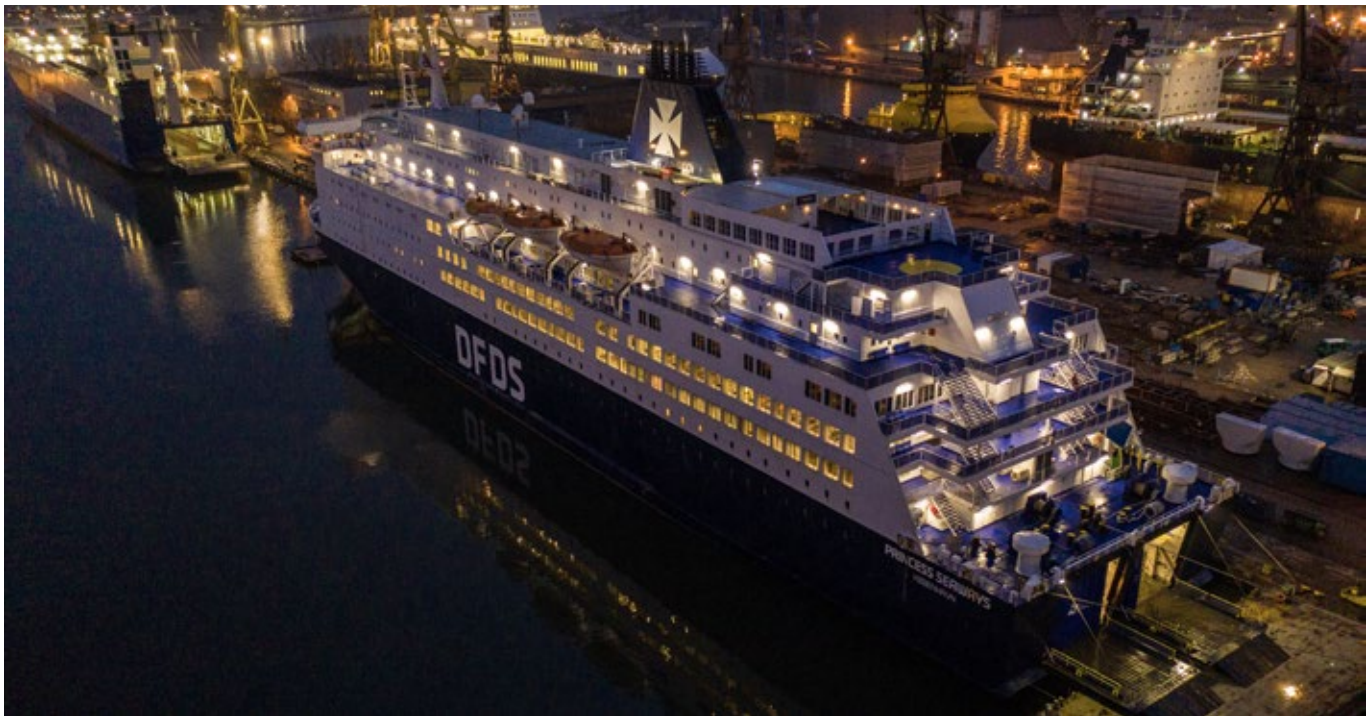
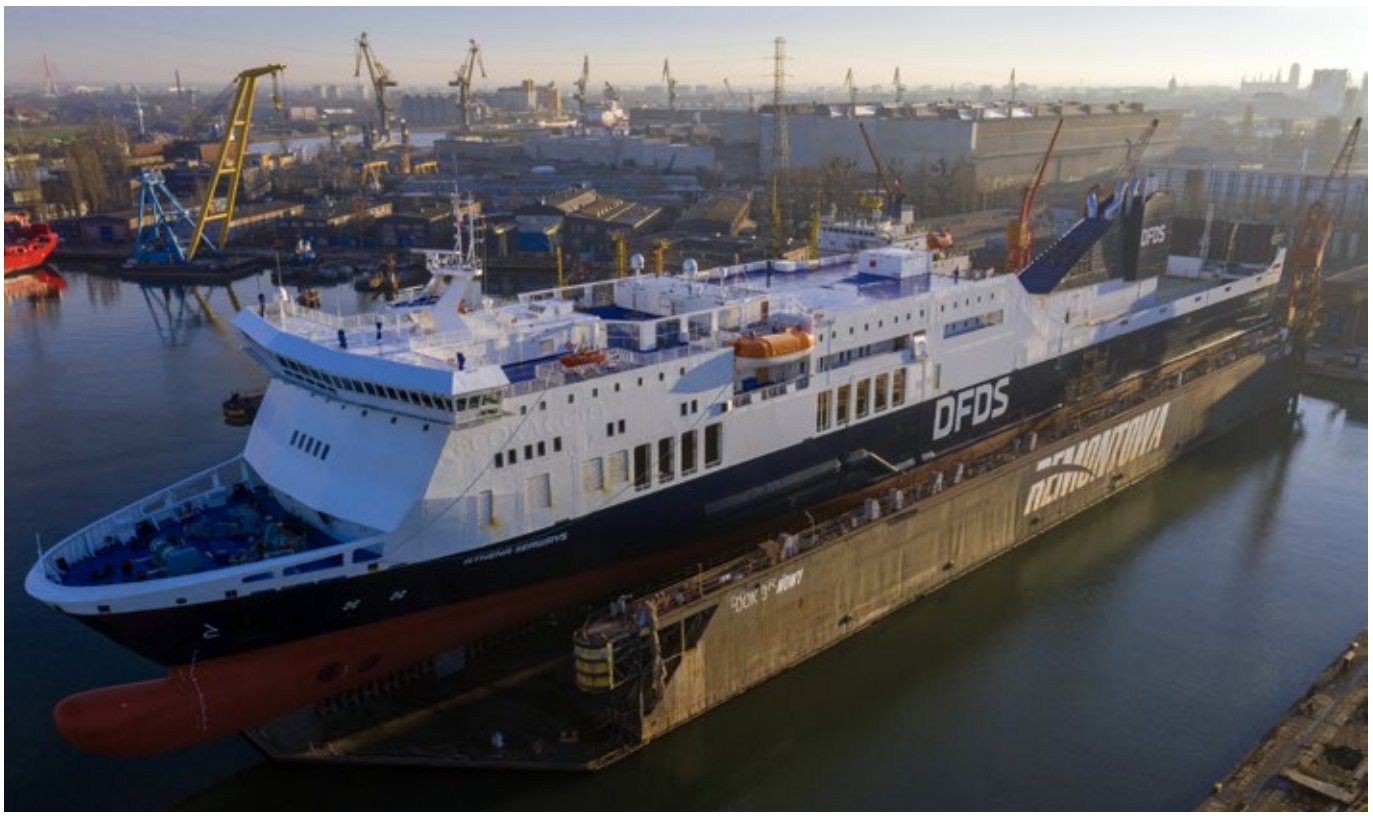
Princess Seaways in the night landscape of the Remontowa shipyard.
Photo: Marcin Koszałka



Athena Seaways called at Remontowa in December 2020.
Photo: Marcin Koszałka

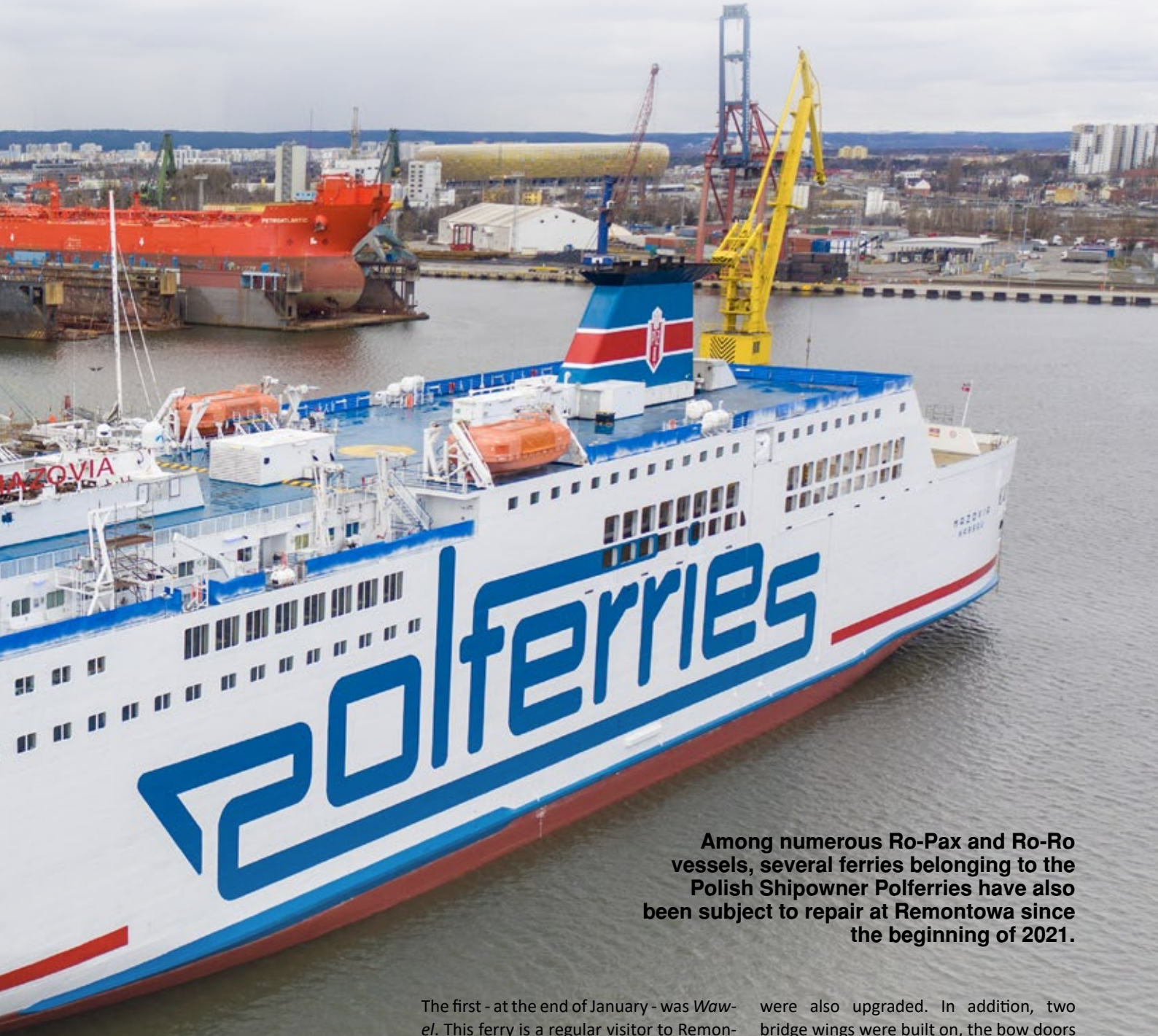


The ferries with "Polferries" logo on the side

Wawel, Nova Star

M/f *Mazovia*, the first (and the only one so far) ferry in Poland with a colourful bow at the Remontowa's quay.
Photo: Marcin Koszałka

and *Mazovia*



Among numerous Ro-Pax and Ro-Ro vessels, several ferries belonging to the Polish Shipowner Polferries have also been subject to repair at Remontowa since the beginning of 2021.

The first - at the end of January - was *Wawel*. This ferry is a regular visitor to Remontowa. She was here for the first time in 2004, just after being purchased by the Polish shipowner. The ship was then thoroughly modernised - first of all, the standard of passenger space was raised.

The ferry gained 131 new cabins at that time. The shops, crew and officer mess as well as lounge areas with airline seats were also upgraded. In addition, two bridge wings were built on, the bow doors were removed and the stern ramp was modernised. Thorough maintenance, numerous inspections and overhauls to the ship's systems were also carried out. The modernisation work was done at an express pace of 88 days.

Afterwards, the ferry arrived here several times for drydockings and class renew-

als - most recently in 2020. Back then, one of the shipyard's main tasks was to install the BWT system. There were also a lot of steel replacements, as well as maintenance and repair work concerning engine room, electrical systems and piping.

The repair project accomplished in February 2021 was dominated by steel replacements, mainly on the hull plating, under the shaft line on the port side. While the ferry was drydocked, measurements and adjustments were also made to both the port and starboard shaft lines. A new pipeline for the grey water system was also installed. Inspections of coolers, pumps and electric motors, among others, as well as minor fitting works supplemented the task list.

The second Polish ferry to call Remontowa in early 2021 was *Nova Star*. Already in 2018, the ship underwent an overhaul of two main engines and three generators here. During the next visit, in spring 2019, the ferry's bulbous bow damaged during manoeuvres in the Swedish port of Nynäshamn was repaired.

In turn, the reasons for this year's drydocking of the youngest ferry in the Polferries fleet were mainly maintenance and painting, overhauls of the right stabiliser cylinder and the ramp cylinder, as well as welding of cracks and repair of the bulbous bow.

Marine Evacuation System was also completed at Remontowa.

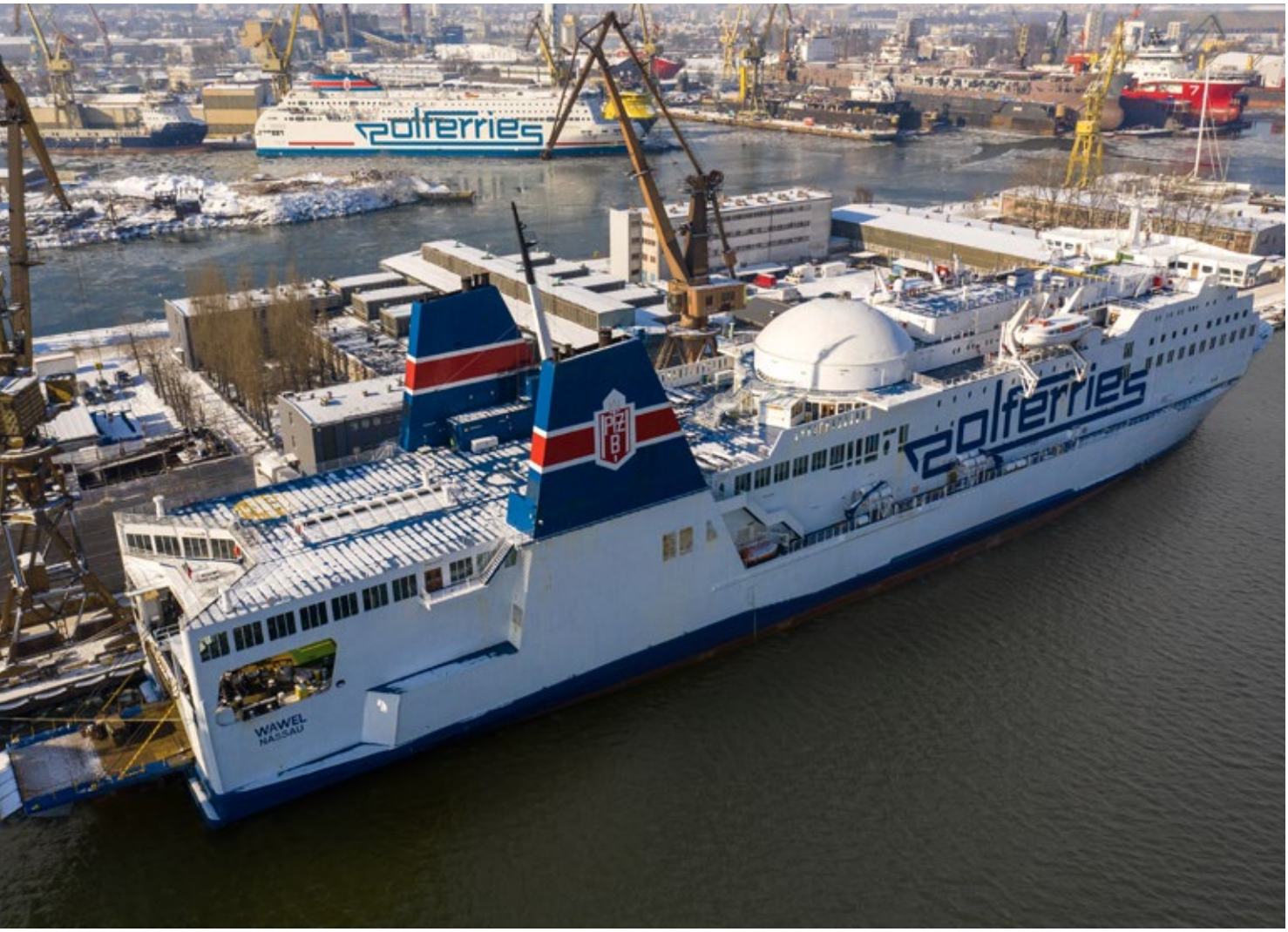
The third Polish ferry repaired in Q1 2021 was *Mazovia*. Here, one of the main tasks was to retrofit the vessel with a BWT system supplied by Alfa Laval.

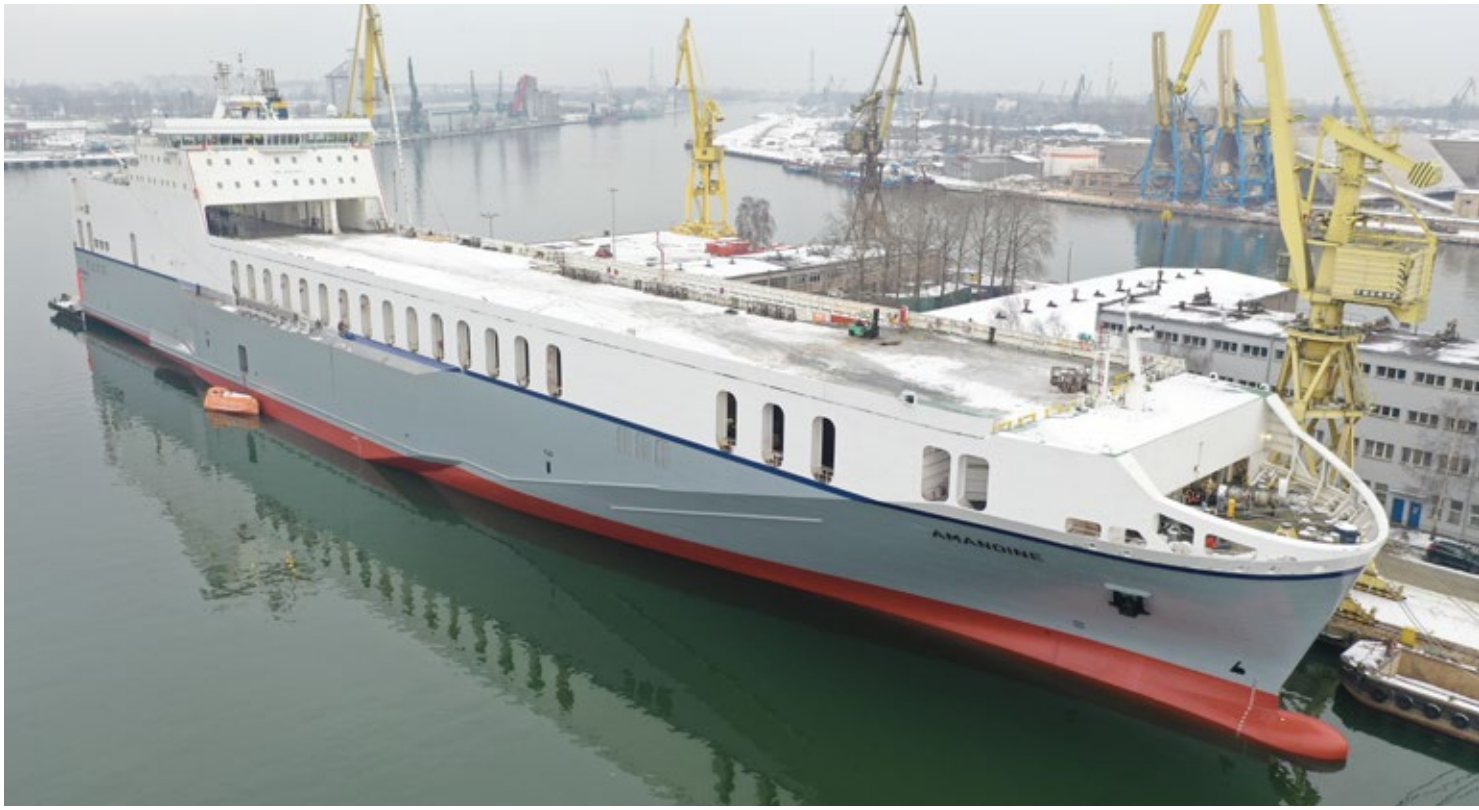
In addition, the ferry underwent a special survey. The scope included inspections of the bottom and outboard fittings, replacement of seals on the propeller shafts, under the propeller blades, replacement of the left rudder blade bottom pintle liner, inspection of the pump engines, overhaul of two auxiliary engine generators and tank cleaning.

The hull and upper car decks underwent maintenance, and the internal ramp - between decks - in the bow area as well as the stern ramp were repaired.

Thanks to her colours, *Mazovia* is one of the most characteristic vessels in the Polferries fleet. She was the first ferry in Poland with a colourful bow, which is a part of a fashionable trend of ethno-design. The graphic, covering an area of about 600 square metres, is in the shape of a fish emerging from the sea, and its scales form patterns reminiscent of folk cut-outs. The author of the painting is Mariusz Waras, an artist from Gdynia. Similar graphics also decorate another ferry from Polferries fleet - M/f *Cracovia*.

M/f *Wawel* (in the foreground) at the quay and *Nova Star* (at the top) at Remontowa.
Photo: Marcin Koszałka





The ship *Amandine* moored to the quay of the Remontowa Shiprepair Yard.
Photo: Marcin Koszałka

CLdN entrusted us with another ship of its Ro-Ro fleet

Extended special survey of *Amandine*

The ro-ro vessel *Amandine*, owned by Antwerp-based Belgian CLdN Cobelfret Group, called at the Remontowa Shiprepair Yard in January for a special survey. The project schedule additionally included several other important items commissioned by the Shipowner that exceeded the scope of a typical class renewal.

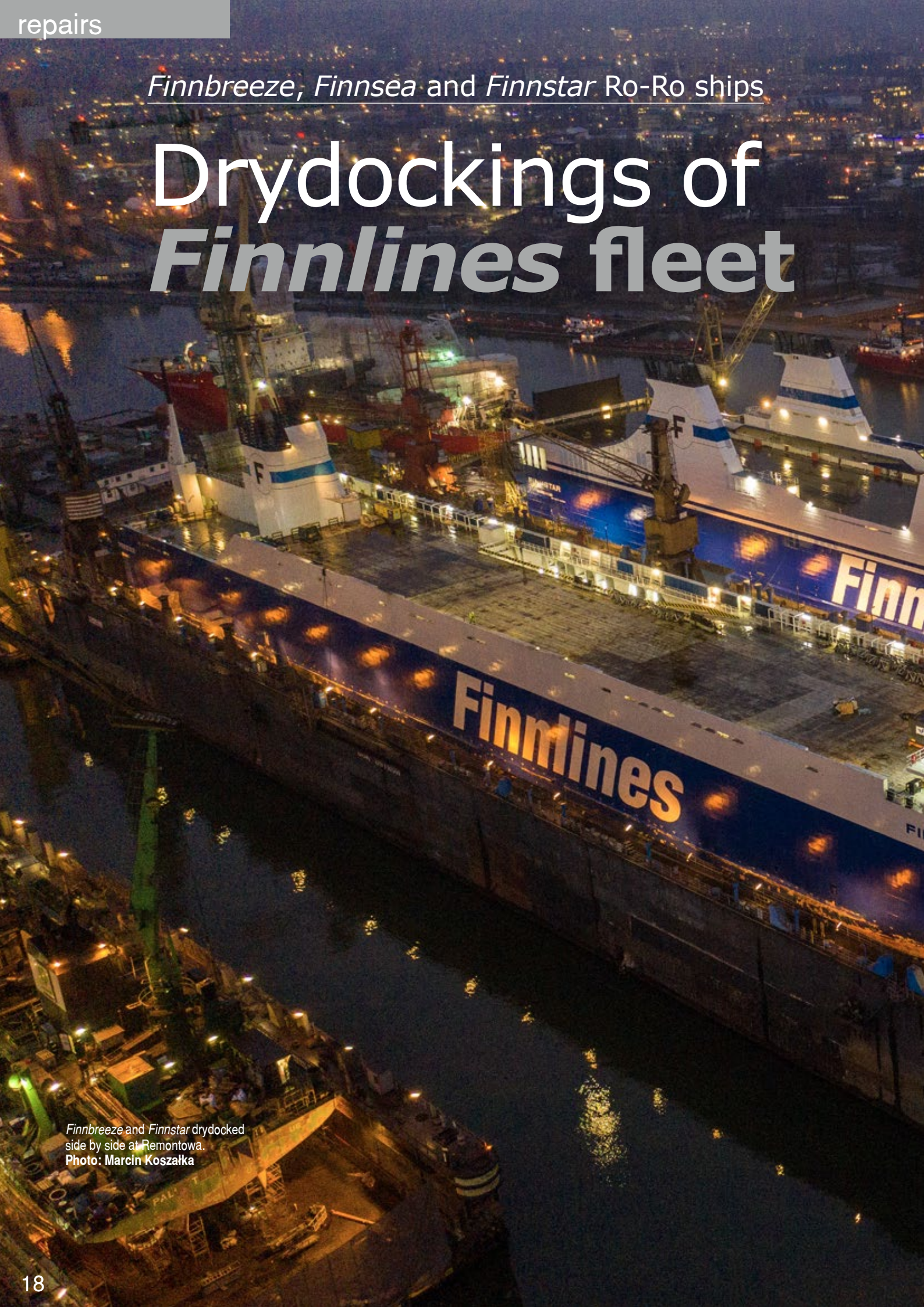
The *Amandine* is a Ro-Ro vessel similar to the *Mazarine*, *Palatine* and *Vespertine*, which underwent modernisation at Remontowa between September 2019 and March 2020. The conversion projects involved equipping those ships with new additional cargo decks located from the superstructure towards the bow and installation of a hydraulic entry ramp. As a result the ships gained additional 1000 tonnes (including the new ramp, various pipelines and other components). Furthermore, thanks to a new extra trailer deck, the ship's cargo capacity has increased from 2907 to 3678 lane metres.

The *Amandine* underwent a second class renewal at Remontowa. The critical jobs consisted of overhauling the shaft line with its disassembly and the replacement of the rudder thrust bearing, as well as the modification of the propeller hub. While our mechanical department took care of the overhaul of the main engine, our welders carried out numerous steel replacements scattered around the ship, mainly on the stern ramp, bow section and port side with a lot of hull damage being repaired.

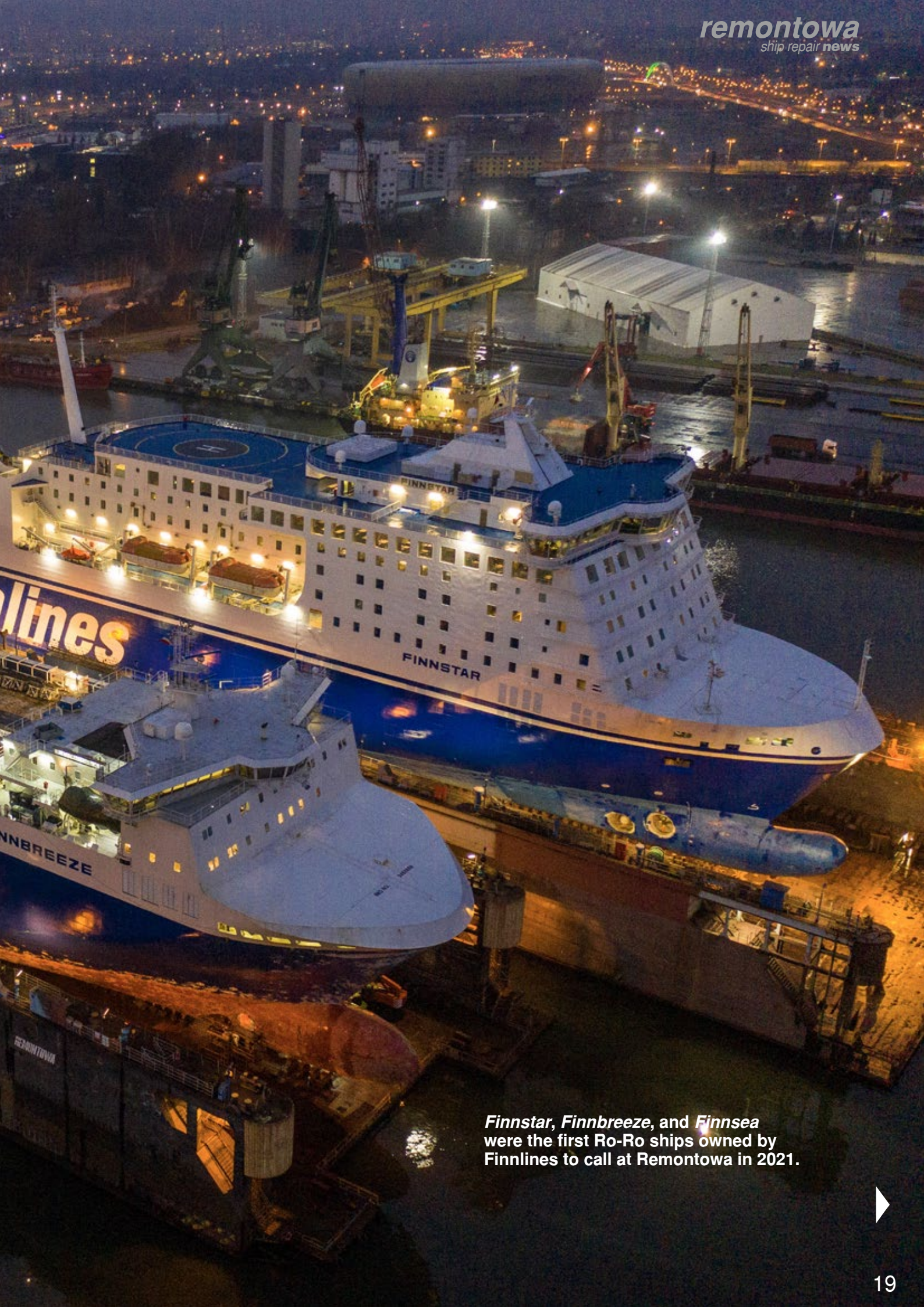
The piping scope of work consisted of installation of four fire-fighting system water monitors (high performance water cannons) and other standard repair works. Finally, the electrical team inspected the fan motors and the painters performed ship's hull comprehensive maintenance.

Finnbreeze, *Finnsea* and *Finnstar* Ro-Ro ships

Drydockings of *Finnlines* fleet



Finnbreeze and *Finnstar* drydocked side by side at Remontowa.
Photo: Marcin Koszałka



***Finnstar*, *Finnbreeze*, and *Finnsea* were the first Ro-Ro ships owned by Finnlines to call at Remontowa in 2021.**

It is worth recalling that two of them underwent lengthening operations at Remontowa in 2018. *Finnbreeze* was the fifth and *Finnsea* the sixth of Ro-Ro vessels converted in our shipyard. The first four extended at Remontowa were: *Finntide*, *Finnwave*, *Finnsky* and *Finnsun*.

After cutting the hull, each of these ships received a steel insert weighing 1,500 tonnes and measuring: 29.5m long, 26.5m wide and 23.5m high. Lengthening the ferries by almost 30 metres has significantly improved their transport capacity, while also reducing the amount of harmful emissions per tonne of carried cargo.

As a result the ships gained 21 per cent in tonnage, 26 per cent of Ro-Ro line and 17 per cent in the volume of containers carried. The lengthening was the shipowner's response to the growing demand for transport on the Baltic Sea.

This year's repair of *Finnbreeze* and *Finnsea* involved drydocking and both had a similar scope of work. Overhauls included: shaft lines, propeller hubs, stabilisers, thrusters, outboard valves and the steering gear. In addition, cleaning of fuel, oil and sewage tanks were carried out. Both ships underwent modification of the fuel tank by stiffening its bottom structure. Finally, the hull maintenance was performed.

Earlier - at the turn of 2020/2021 - *Finnstar* called at Remontowa. The repair project featured an extensive scope of work.

One of the critical tasks involved an application of a new, special thick-coat paint suitable for winter conditions. One layer of such paint amounts to 500 microns!

While the ship was drydocked, once all propeller blades had been removed, weighing 16 tonnes propeller hub was dismantled from the shaft line and transported for measurement and mechanical treatment.

The steering gear and the thrusters were repaired. The so-called Promas nozzle, installed between the rudder blade and the propeller, providing up to 15 per cent less fuel consumption and improving the ship's manoeuvrability, was replaced as well.

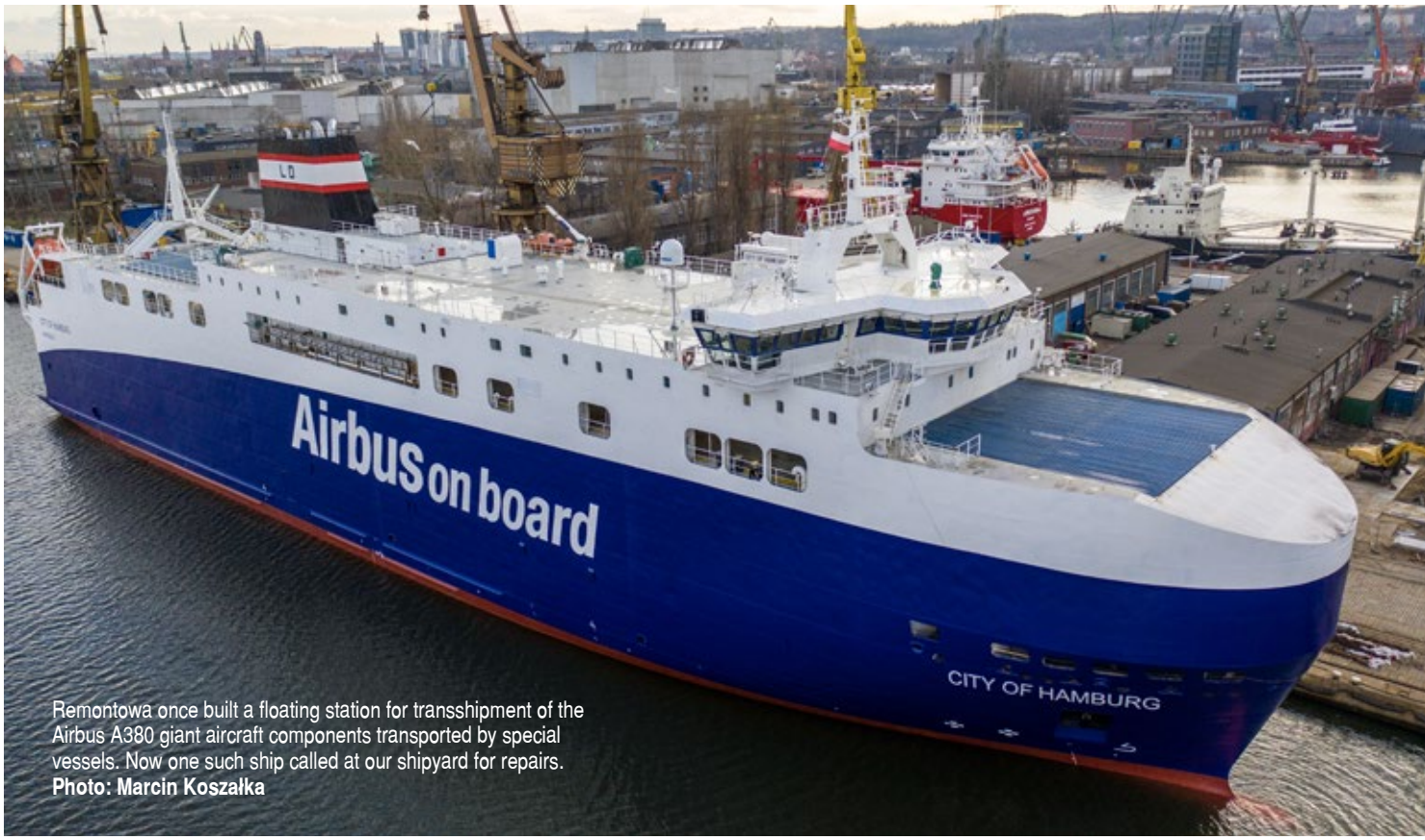
The scope of work also included the clean-up of several fuel tanks, grey and black water tanks and the ballast cross over pipe.

Fans and outboard valves were inspected and overhauled. A number of black water, heating pipelines, several sections of GRE pipes, vent pipes on the main and auxiliary engines were replaced. Steel replacement in the main engine pipeline system also included the so-called "CuNiFeR" filters, consisting of copper, nickel and iron alloys.

Another major task was the replacement of more than 300 square metres of insulation in the ship's four scrubbers, as well as the replacement of the main engine exhaust filters. The repair required also the overhaul of the scrubber pumps and their motors.

In addition, dozens of sockets on the lowest cargo deck were replaced along with cleaning of the tanks in which these sockets are located. A particularly complex job involved the replacement of the bottom part in all boilers, together with blanking the heating coils and laying insulation. The scope was complemented by cleaning the main and emergency switchboards.

Finnsea at the quay (in the foreground) together with the *Finnbreeze* and *Finnstar* Ro-Ro ships (top right) at Remontowa.
Photo: Marcin Koszałka



Remontowa once built a floating station for transshipment of the Airbus A380 giant aircraft components transported by special vessels. Now one such ship called at our shipyard for repairs.
Photo: Marcin Koszałka

The ship that carries parts of giant aircraft

Airbus on board!

The *City of Hamburg* is a Ro-Ro ship designed to transport components and subassemblies for the construction of aircraft, between Airbus facilities in Broughton, Hamburg, Mobile, Tianjin and Toulouse.

Seaborne transport is primarily used for large-scale components that cannot be transferred by air, even in the purpose-built Airbus A300-600ST (Super Transporter) Beluga aircraft. Airbus and its production facilities around the world use several Ro-Ro ships to transport components. Some of them are chartered, while others, like the *City of Hamburg*, belong exclusively to the Airbus family, as evidenced by the large inscription on the side: „Airbus on Board".

The *City of Hamburg* entered Remontowa in February 2021.

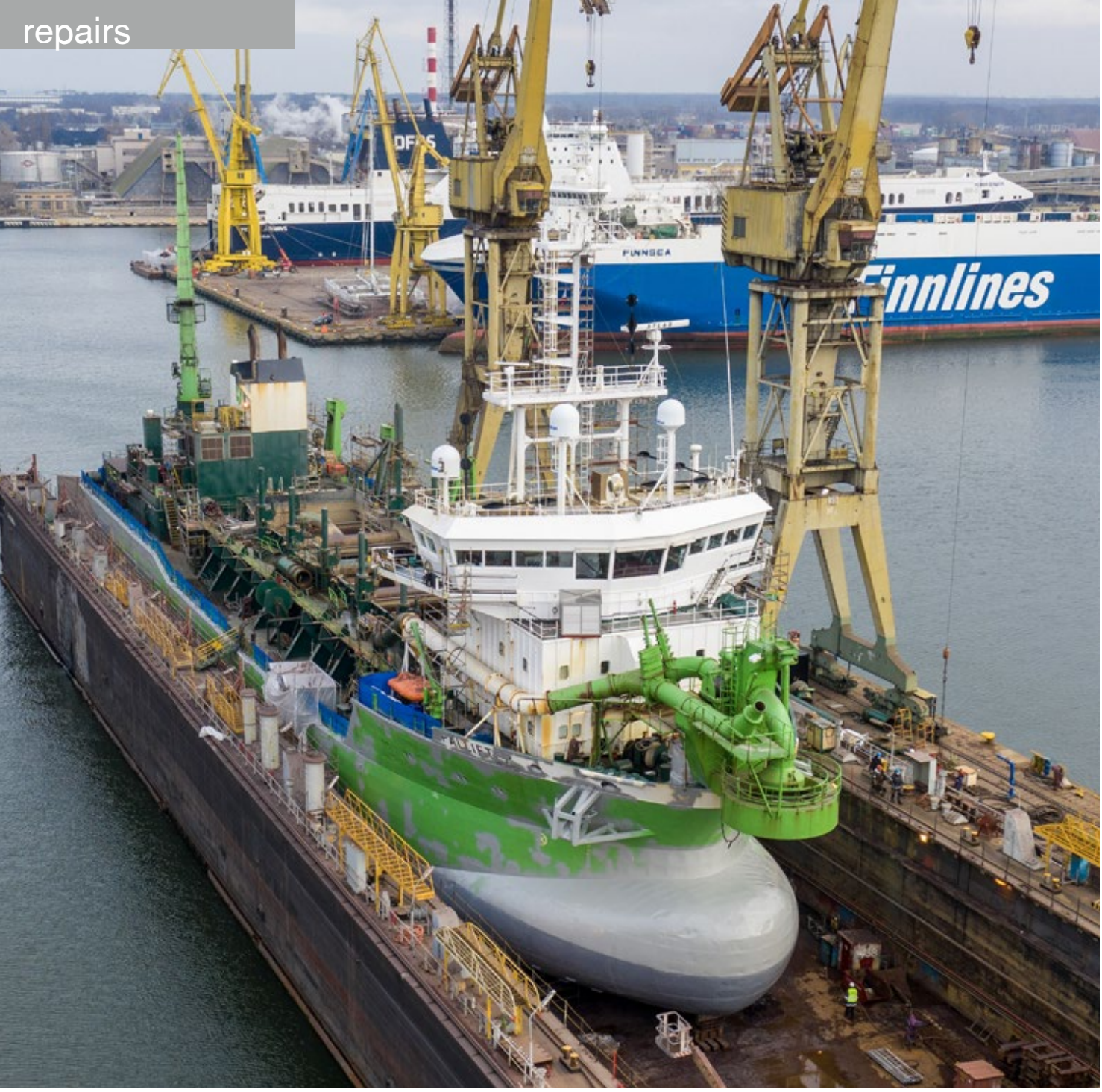
The shipyard's primary task was to modify the shaft lines, which involved adapting the shaft line sealing system to use biodegradable oil and separating it from the controllable pitch propeller hydraulic systems. To this end, when the ship was dry-docked, the propeller shafts were dismantled and modifications made inside the propeller hubs.

The Shipowner also ordered modifications to the BWT system, as well as overhauls of the thrusters and stabilizers. The ship's main engines underwent repairs. The floors in the superstructure were replaced, the galley and bathrooms were also refurbished. The hull underwent comprehensive maintenance.

Once the rudder blades had been removed and both shafts pulled out, they were subject to mechanical treatment to reduce backlash on the rudder stock liners. In addition, the aft rudder bearing on the port side was replaced.

It is worth mentioning that Remontowa in 2004 built a floating station for transshipment of the Airbus A380 giant aircraft components. The 150 metre long and 35 metre wide structure was towed from the shipyard and permanently moored in the port in Pauillac, France, at the mouth of the Garonne river.

It was the site where seagoing ships brought in A380 components, such as wings and large fuselage sections, manufactured in various European countries. The ships moored at the station on one side and river barges on the other, which after reloading the large components transported them further to Langon. Then the components of the giant aircraft were moved by land on special platforms to the Airbus factory in Toulouse, where the planes were finally assembled.



Pallieter was the first dredger to call Remontowa this year for drydock.
Photo: Marcin Koszałka

Maintenance repairs and class renewals of Dutch and Belgian dredgers

Pallieter and *Utrecht*

Every year Remontowa Shiprepair Yard is visited by at least a few specialised vessels used in the marine engineering sector, such as dredgers and pipe burying vessels (rock dumping vessels).

The Shipowners such as Royal Boskalis, Van Oord, Jan De Nul, DEME have entrusted Remontowa with repairs and modernisations of such vessels, which are regularly hosted in our yard.

The first dredger drydocked by Remontowa this year was *the Pallieter*, owned by DEME. It is worth mentioning that we had repaired dredgers of this Belgian shipowner before i.e *Charlemagne* in 2017 and *Reynaert* in 2018, among others.

While in dock, the dredger underwent a comprehensive repair, including the inspection and overhaul of various systems and equipment. Many worn out components and sub-assemblies were replaced, hence restoring their original efficiency.

All bottom doors were overhauled and their hydraulic cylinders replaced. Two tailshafts, having been previously dismantled, also underwent inspections with a worn bearing bushes replaced and aligned.

In addition, the outboard valves and ballast water treatment system's equipment were refurbished. It is also worth mentioning, that the main dredging pipe has been repaired and partially renewed. A standard hull maintenance was also carried out.

A significant scope of work was also done on a trailing suction hopper dredger *the Utrecht*, owned by Dutch company Van Oord, who has been cooperating with Remontowa for many years. It is enough to mention the backhoe dredger *Hippopotes*, which underwent a major overhaul in the past here, or recently - *Vox Amalia*, which was drydocked last year and underwent significant modifications to its main piping and dredging systems.

The *Utrecht* arrived at Remontowa in February 2021 for her class renewal. In addition to the special survey, nearly 50 tonnes of steel were renewed on the hull, in the hopper and on the decks. Furthermore, various pipelines have been renewed, and the hull underwent a maintenance.

The loading line, which transports the dredged material to the hopper, has been replaced, and the two suction lines of the dredge system have been repaired.

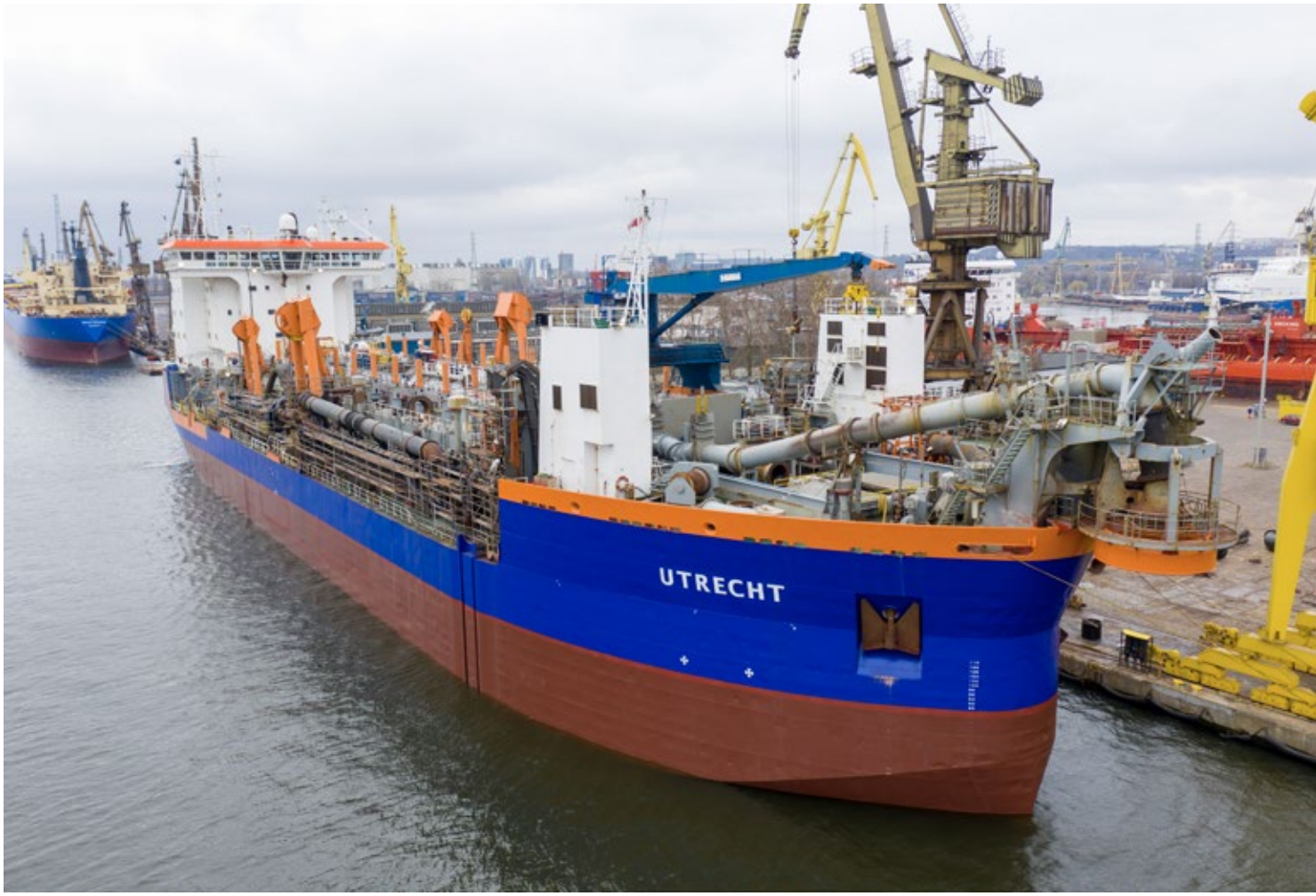
Large-diameter pipes were replaced with new ones in the pump room. The Alfa Laval ballast water treatment system, which uses UV light to neutralize microorganisms, has been installed.

One of the major tasks was fabrication and renewal of walkways around the dredger's hopper.

Both shaft lines were overhauled in the yard's workshop. The propeller hubs were also repaired, the rudder blades and the bow thruster were overhauled, too. Numerous outfitting works in the superstructure were carried out.

The dredger also underwent extensive paint maintenance including the hull, decks and the upper part of the hopper. The fuel, oil and ballast tanks have been inspected and cleaned.

The dredger *Utrecht* visited Remontowa for a special survey.
Photo: Marcin Koszałka



Smeraldo was another in a series of Italian chemical tankers that underwent a special survey at Remontowa.
Photo: Marcin Koszałka

Further chemical tankers from Italian Shipowner Finbeta S.p.a

Special survey of *Smeraldo*

***The Smeraldo* and *the Rubino* vessels that belong to the Finbeta S.p.a. fleet, called at the Remontowa Shiprepair Yard in early 2021. However, we had repaired chemical tankers owned by the Italian shipowner from Savona before.**

Almost a year ago we performed the dry docking and repairs of *the Turchese*. Whereas, last spring we hosted *the Sapphire*. Both chemical tankers underwent a special survey at Remontowa, including maintenance and painting of the hull, as well as a general overhaul of the main engine.

This year the *Smeraldo* has renewed its class in our yard. Scope of work included, among others, an overhaul of the ship's propulsion system and the main engine.

The Becker rudder link system was subject to a major overhaul, which consisted of prefabrication and installation of a new liner. The rudder blade itself required steel replacement, which involved dismantling and transporting it ashore. Steel replacements were also carried out in the ballast and cargo tanks.

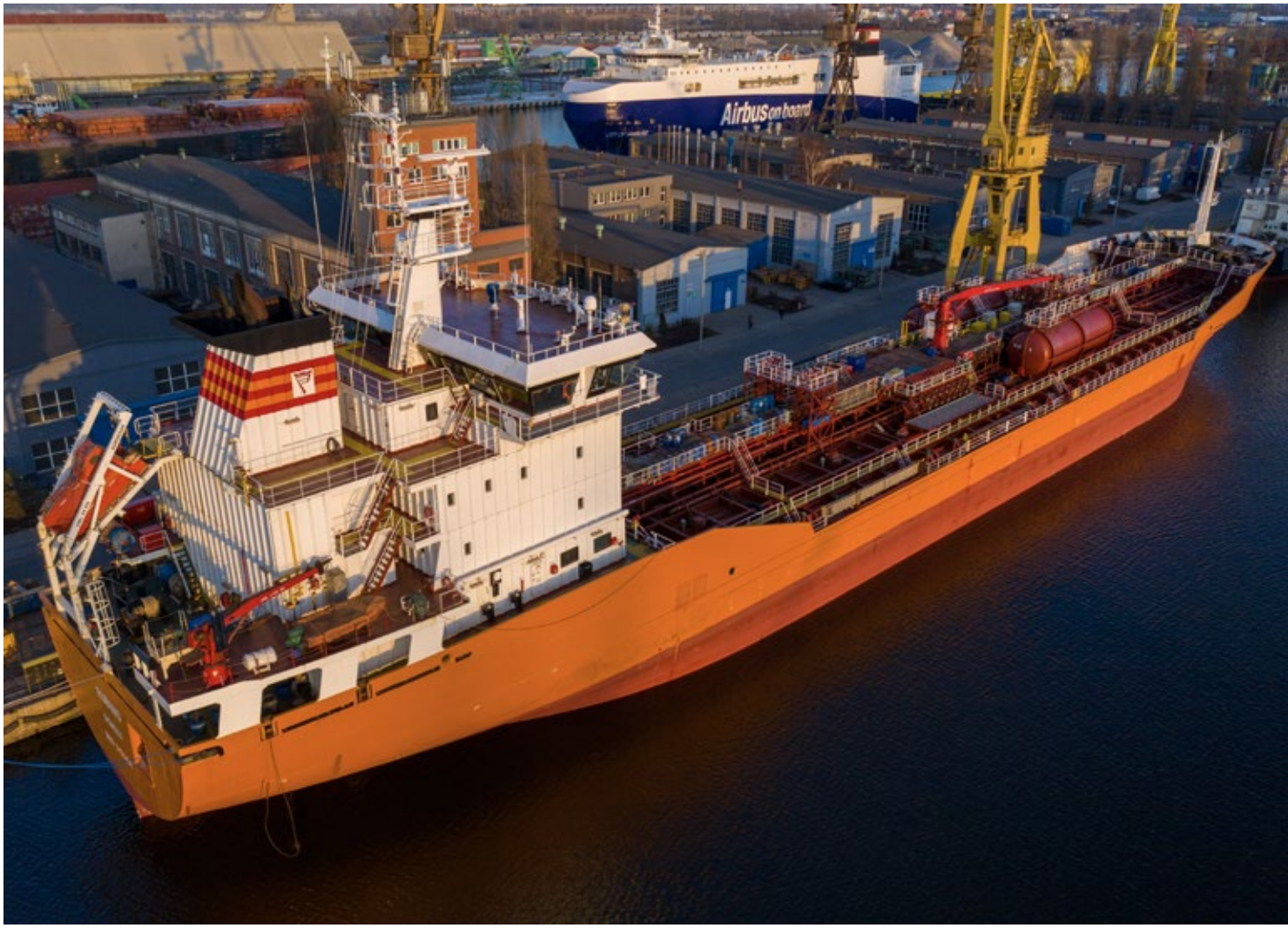
Another significant scope involved the deck equipment repair, as well as the replacement of the hydraulic motor seal of the mooring winch and the cylinder of the provision davit.

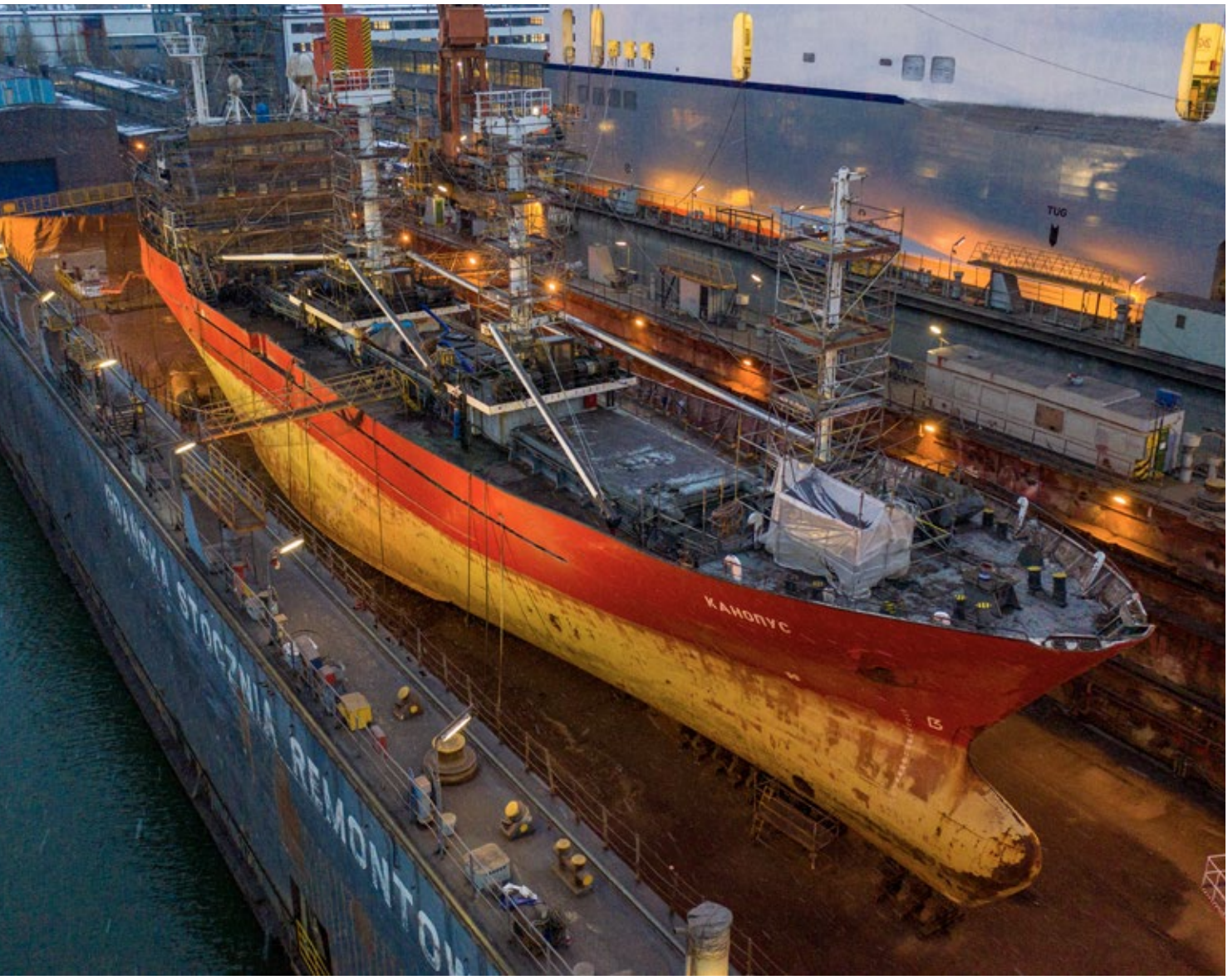
In addition to the standard overhaul of overboard and PV valves, a numerous seawater pipelines were renewed. Furthermore, the auxiliary engine generators and fans were refurbished in the engine room.

While *the Smeraldo* was still in the shipyard, another chemical tanker, the *Rubino* called at Remontowa. It is worth recalling that the ship in question had already been serviced here in July 2020, under its former name *Cevdet A*.

This year the critical jobs involved the steel replacements in the bow area. In addition, the two main generator sets were overhauled.

Rubino has been repaired here for the second time.
Photo: Marcin Koszałka





Canopus in the shipyard dock.
Photo: Marcin Koszałka

Frio *Arkhangelsk* and *Canopus* in our docks

Russian reefers

***The Frio Arkhangelsk, the Frio Murmansk, the Frio Valdivostok* and *the Frio Petropavlovsk* are regular visitors at the Remontowa Shiprepair Yard. *The Frio Arkhangelsk* has already been serviced four times in the course of the last eight years.**

The *Frio Arkhangelsk* reefer vessel is designed to receive fish at sea, directly from trawlers, using special booms for handling. However, her last passage, before calling at Remontowa, differed from the previous ones. Instead of a standard cargo of fish, the *Frio Arkhangelsk* took on 2,000 tonnes of snow crab, with which it sailed to the Netherlands.

While at Remontowa, two hatch covers were repaired and the steel in one of the tanks was replaced. Piping sections were renewed and ventilation covers and gangways repaired.

The Canopus was another reefer that called at the yard.

The main scope of work involved the replacement of the sewage treatment plant. The old tank was dismantled and removed from the ship, and a new treatment plant was installed in its place, together with a complete connection to the electrical system and piping.

A new fire-fighting system was installed in one of the holds to protect the transport of, among other, fishmeal, which is a dangerous and flammable cargo.

While docked, *the Canopus* was repainted with new colours all around the hull, superstructure and funnel.

The mooring winches and anchor windlasses were extensively refurbished, which included replacement of the clutch, fabrication of a new shaft and windlass foundation as well as the renewal of part of the deck on which it is placed.

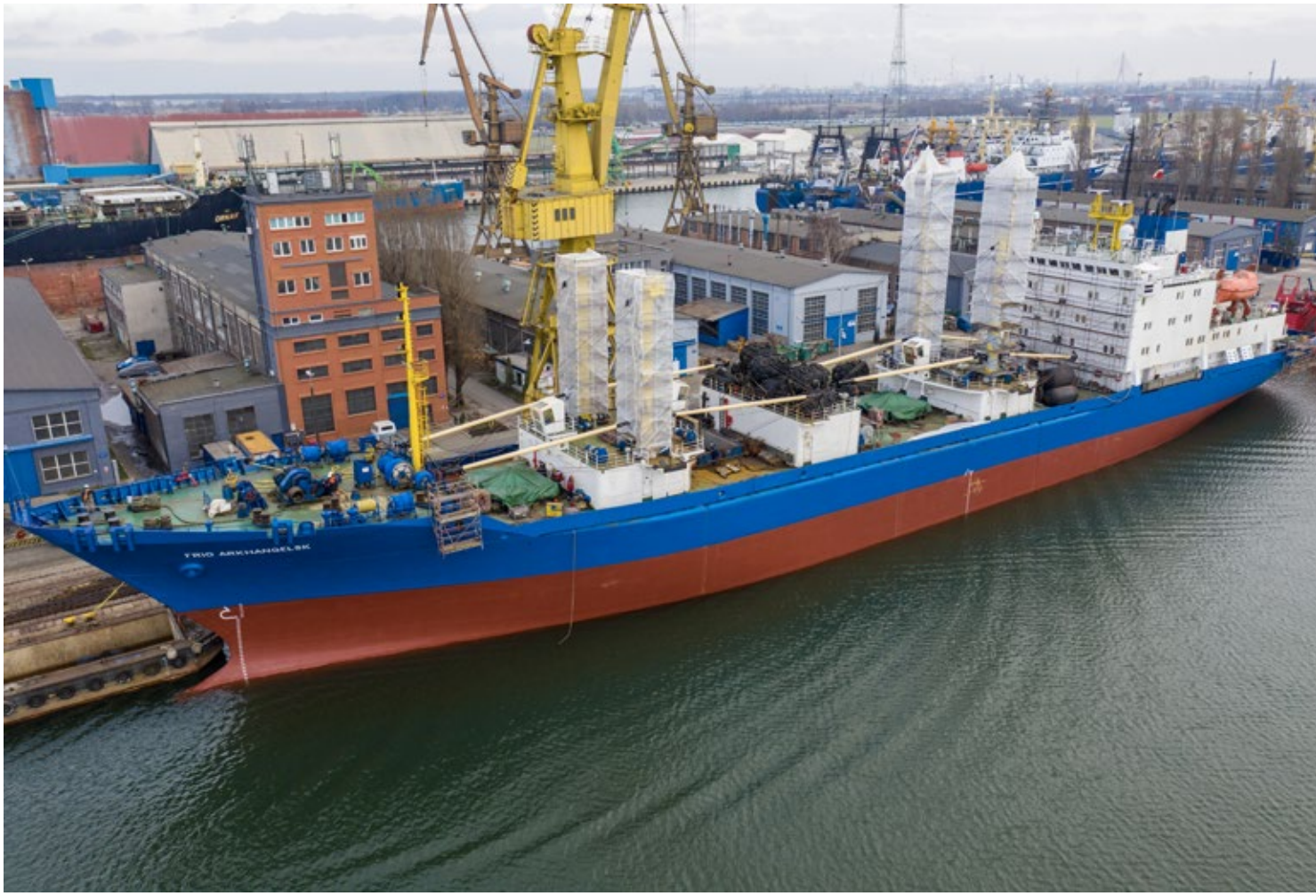
Several steel inserts were welded to the outer part of the plating. Additionally, the bilge wells in the tank top section between several holds were replaced.

A very large and labour-intensive task was to replace all the ballast pipes in the ballast tanks on the ship with new ones.

Furthermore, inspections of the hatch covers were carried out, as well as, the replacement of the hydraulic pipes and manipulators.

Once the repair of the *Canopus* vessel had been completed, the third Russian twin refrigerated ship that called at Remontowa for a repair project was The *Sirius*.

The *Frio Arkhangelsk* refrigerated ship is a regular visitor to the Remontowa Shiprepair Yard. It has been her fifth visit here.
Photo: Marcin Koszałka



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