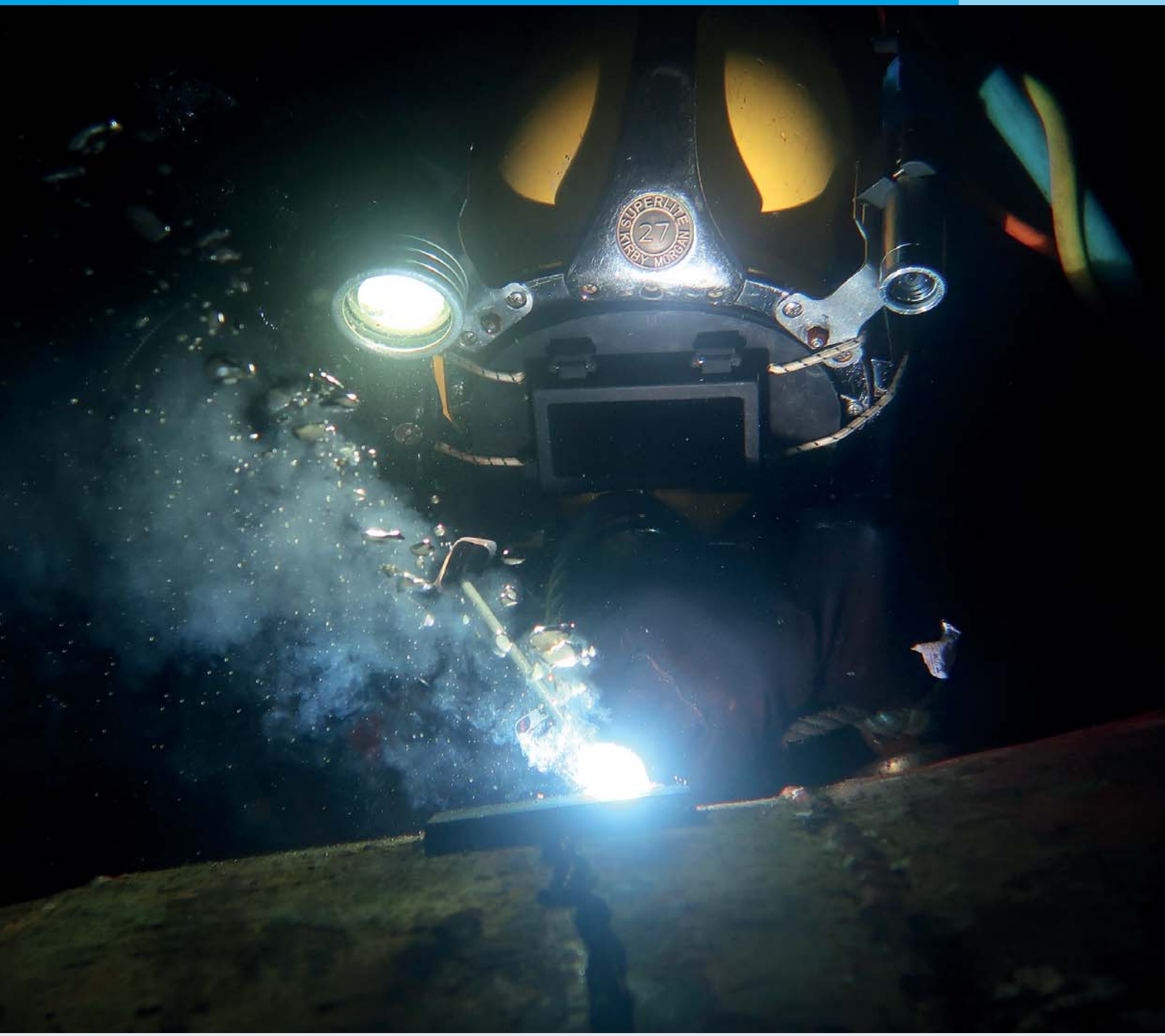
HYDREX®

UNDERWATER TECHNOLOGY

Magazine

Number *289*



In-water bow thruster repairs

The Hydrex lightweight flexible mobdocks are designed to be easily transported around the world and are used to close off the thruster tunnel on both sides, allowing divers to perform repairs and other operations in a dry environment around the bow thruster unit.

This technique enables them to reinstall the propeller blades of an overhauled thruster inside the thruster tunnel after the unit has been secured or replace the blades or seals and perform repair work on a specific part without removing the unit.

Since the development of this flexible mobdock technique, numerous thruster repairs have been carried out by Hydrex diver/technicians around the world.

There is no need to send the vessel to drydock as all operations can be carried out in port or while the vessel is stationary at sea. Normal commercial activities can therefore continue without disruption.

HYDREX®
UNDERWATER TECHNOLOGY

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Editorial

Welcome to the latest issue of our Hydrex magazine. This month we once again cover a wide variety of topics. Although they showcase the diversity of operations our divers carry out on a daily basis, they only cover the tip of the iceberg.

On our website (www.hydrex.be) you can find a more comprehensive overview of the services we offer to our customers. If you need more information on any these, do not hesitate to contact me. I am always available to answer your questions.

Besides a wide variety of routine repair and maintenance operations we can also assist you with almost any unique situation. Finding solutions is what we have been doing for the last 45 years.

Whether you need a simple inspection or a complex tailormade repair, please contact me and together with my team I will take the worry out of your hands.

Hydrex founder
Boud Van Rompay
bvr@hydrex.be

ISO 9001 certified

Underwater services and technology approved by:

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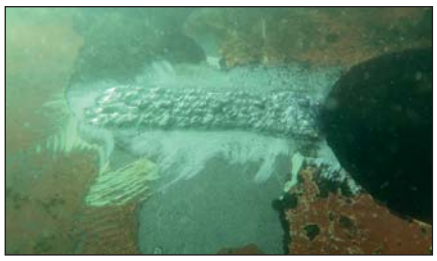

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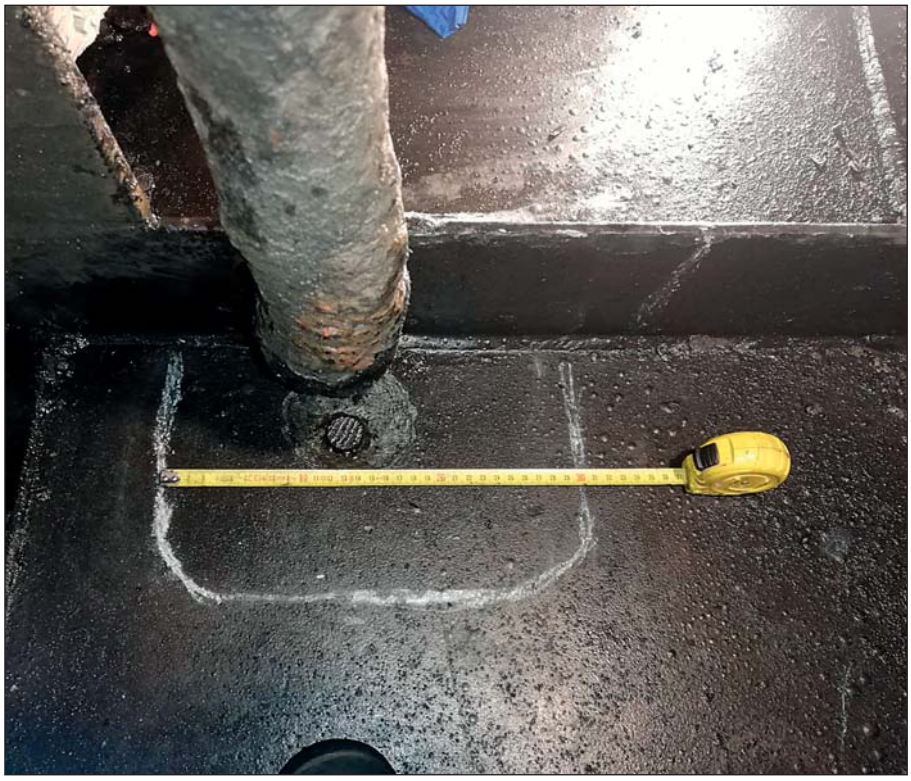
Underwater insert repair in Rotterdam

A 130-meter chemical tanker suffered erosion damage in the grey water tank. We were contacted by the owner to provide an underwater solution that would allow the vessel to keep her schedule. A team of our diver/technicians therefore mobilized to Rotterdam to perform on-site repairs.

This type of smaller damage is created over time as the result of the recurring impact of for instance water on the exact same spot over and over again. On vessels this occurs regularly in the ballast tanks under bell mouths or sounding pipes as was the case with the chemical tanker.



Measuring and marking the exact area that needed to be removed.

We have a wide range of cofferdams at our disposal.

If the damage is caught before the hull plates are perforated, clad welding can be used to fill up the area. This is also a permanent repair that will avoid a condition of class. During the operation in Rotterdam this was no longer an option as a hole had formed in the hull plating.

A fast, permanent solution

The divers started the operation by installing a cofferdam on the waterside of the affected plating. Next they removed the sounding pipe covering the area on the inside. They could then safely remove a plug which had been installed as a temporary solution. The damaged plating was then cleaned and prepared for the operation.

The insert was welded following our class-approved procedure.

All our divers are able to perform underwater procedures to the same high quality standard.

An independent inspector carried out ultrasonic testing.

As agreed with the classification society, the team then cut away an area measuring 300 x 300 mm. Next they prepared the edges of the hole for the insert and positioned the new plate. The insert was then welded following the Hydrex class-approved procedure for insert plates, using a full penetration weld.

An independent inspector carried out ultrasonic testing and the repair was approved by the classification surveyor who was present during the operation. The team then reinstalled the sounding pipe and removed the cofferdam.

A small doubler plate was installed under the pipe to prevent the new insert from eroding again.

New insert plate seen from the waterside.

A small round doubler plate was installed under the pipe to prevent the new insert from eroding again.

Conclusion

We offer class approved permanent repairs for this type of damage. These combine underwater cofferdam installation and inside dry welding. We have a wide range of cofferdams at our disposal as well as certified plating which we can mobilize immediately to any location.

Both parts of such an operation are performed by the same team of in-house trained diver/welders working at the highest quality standards. In most cases normal commercial activities can continue without disruption. ■

If you have received this magazine at the wrong address or if your company is going to move, please let us know.

You can contact us at:
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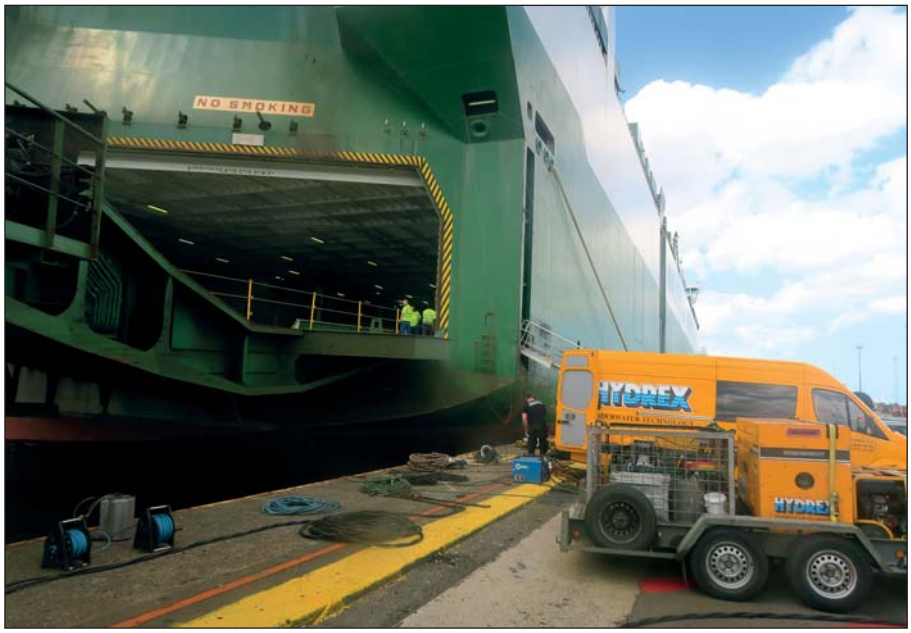
KEEPING SHIPS IN BUSINESS

Rudder repairs in Zeebrugge, Dunkirk and Le Havre

Our teams carried out several rudder repairs on ships in Belgium and France. In all cases cracks were found that needed to be repaired to prevent them from spreading and causing further damage to the rudders.

We can perform repairs at anchorage on any type of rudder or while the vessel is berthed. In most cases this can be done without interrupting cargo operations. The following case studies give an account of some of the recent examples of this.



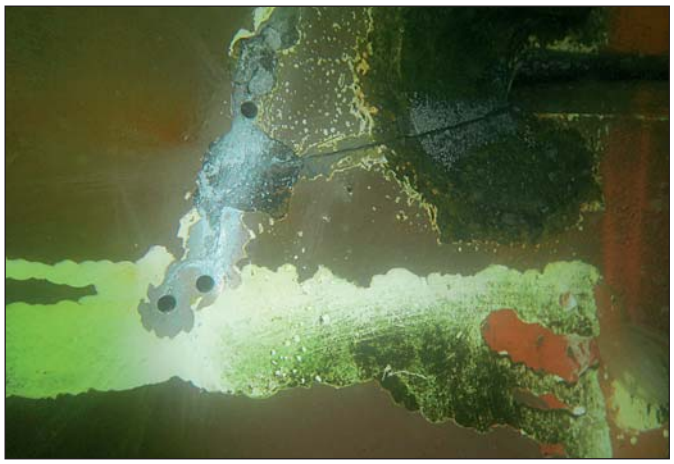
Hydrex team preparing for rudder operation in Zeebrugge.

Rudder cracks repairs above and under water

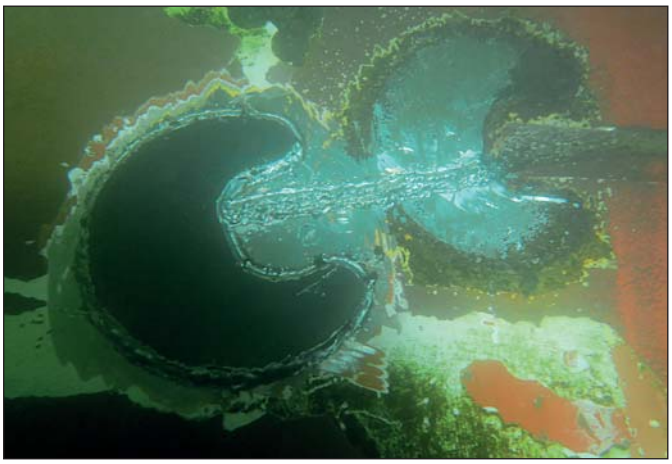
A 230-meter roro ship in Zeebrugge had suffered cracks on both sides of the rudder flap. On the starboard side a branching crack was found while a single crack was present on the port side.

Our divers first drilled arrests on all extremities of the cracks to prevent them from spreading. They then positioned C-shaped plates over the crack arrests and secured these with wet welding.

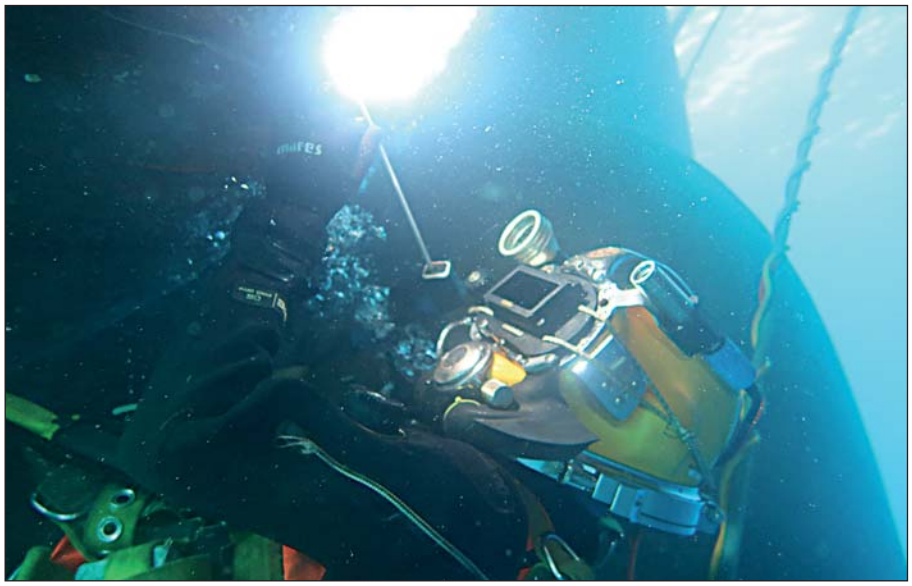

Branching crack on rudder of roro ship.



Crack arrests were drilled on the extremities of the cracks on both side of the rudder.



C-shaped plated welded over the crack.



Hydrex diver/welder during underwater operation.

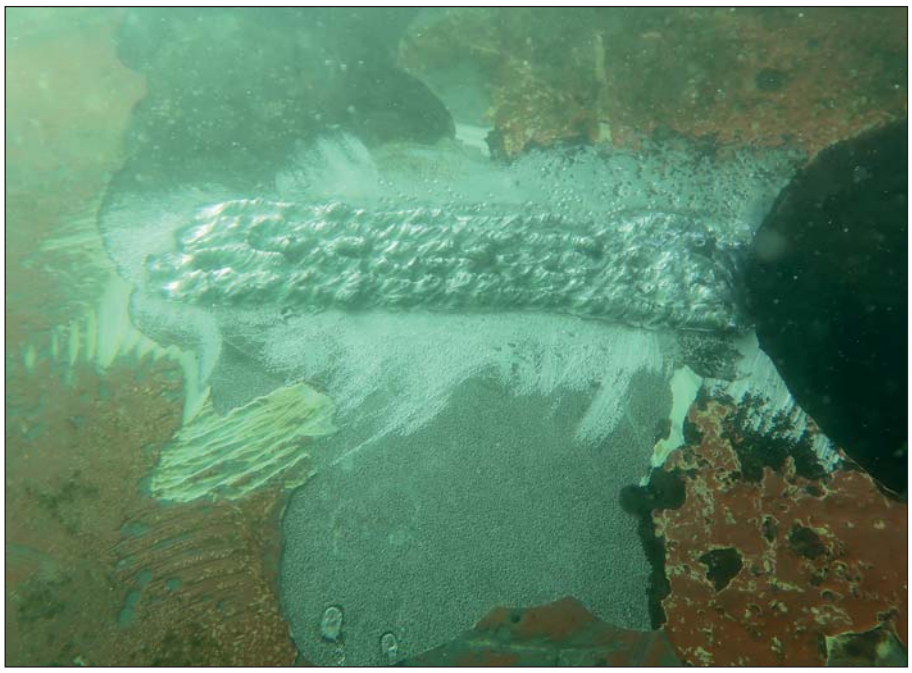
This allowed the owner to sail his ship without having to worry about the condition of the rudder. He could have a permanent repair carried out during the ship's next scheduled drydock visit at a more convenient time and location.

On two 229-meter sister bulker ships in Le Havre and Dunkirk respectively, cracks were found on the upper pintle corner of the hinge that connects the rudder flap to the main rudder blade. Fortunately these cracks could be repaired by grinding them out after a crack arrest had

Crack on rudder of bulker in Le Havre.

Hydrex technician grinding out the crack in Le Havre on the trimmed vessel.

Ground out crack, ready to be filled.



Welding was used to fill cracks on two sister vessels after they had been ground out.

One of our divers getting ready for underwater rudder operation in Dunkirk.

been drilled. The affected area was then filled with clad welding.

Timely discovery prevents more costly repairs

The cracks on these rudders were spotted during an underwater inspection before they caused problems for the ship. This once again shows the benefits of having regular inspections carried out by competent divers, followed by comprehensive and accurate reports. Our teams can detect any problem so that they can be corrected early and prevent the more costly repair which neglect and further damage would bring about. ■

High quality in-water ship re

Permanent insert repairs
Specialist class approved insert repair work carried out on a permanent basis. Providing a real alternative to drydock.

Emergency repairs
Fast response emergency repairs worldwide.

Inwater video inspections
Professional video surveys provide a reality of the problem and enable owners and classification surveyors to directly diagnose any problems.

Echo sounder inspection and replacement

Speed log
Checks for damage, marine fouling and replacement.

Bow thruster and propellers
Permanent on-site repair, maintenance and replacement with the award winning flexible mobdock technique.

Hull cleaning on suitable coatings

Bilge keel
Check and repair broken welds, renewal of sacrificial anodes.

pair and fuel saving services

Sea valves, sea chests and gratings
In-water inspection, cleaning and repair of intakes and valves, installation of new sea chests, condensers and coolers afloat.

Stern tube seal replacement
Permanent inwater stern tube seal replacements and repairs with the unique Hydrex flexible mobdock technique.

Propeller operations
Propeller cleaning with special tools, on-site blade straightening and cropping. Permanent repairs to all types of propellers or installation of propeller cone fins.

Rudder repairs
Permanent on-site repairs on all types of rudders with groundbreaking new technology.

Pintle and bushing repair and replacements

Afloat propeller operations in Northwestern Europe

Hydrex diver/technicians carried out afloat propeller operations on vessels in Belgium and the Netherlands. In Antwerp the damaged blades of a 190-meter roro vessel were cropped, while in Amsterdam and Rotterdam the propeller blades of two 229-meter bulkers were modified to allow the ships to save fuel while sailing at lower RPM.

Hydrex workboat and equipment next to a roro vessel in Antwerp.

When damage to propellers occurs due to impact with ice and other debris, Hydrex will help you, even if the damage is quite extensive.

A ship with bent or cracked propeller blades might experience severe vibrations while sailing. The classification society might demand a repair before the vessel is allowed to sail on. By straightening the blades or cropping them, Hydrex can restore the propeller's balance, resulting in a green light from the class for the vessel.

Diver/technician measuring one of the cropped pieces of blade.

A propeller modification can easily be combined with any other maintenance or repair operation that needs to be carried out on the vessel. Thanks to the flexibility of the Hydrex teams impact on a sailing schedule can be minimized.

In the following case study cropping was the only option as the damage to the propeller blades was too great to allow cold straightening. This kind of repair is carried out with the propeller blade cutting equipment developed by the Hydrex research department.

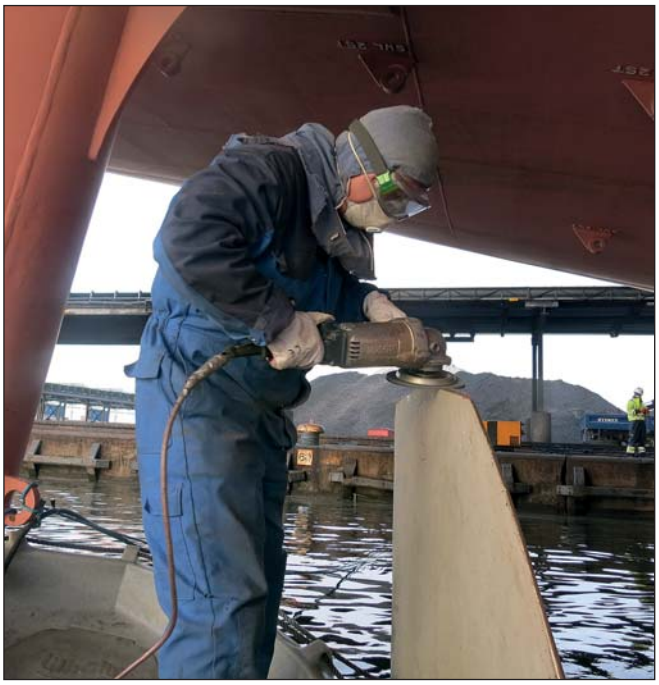
Overnight cropping in Antwerp

Three of the five blades of a roro vessel were severely bent, with one of these blades bent at an angle of 70°. An on-site solution was needed to restore the propeller's balance and

Testing one of the modified blades in Amsterdam for cracks.

Modification of one of the blades of a bulker in Amsterdam.

Any type of propeller modification can also be carried out underwater.



Grinding the edge of a modified propeller blade as specified.

efficiency. A team was therefore mobilized from our headquarters in Antwerp to the ship's location.

After the equipment arrived the team started the operation with a detailed survey of the complete propeller. Our men then used the information acquired during the inspection to calculate and determine the correct cutting line needed to modify the trailing edges of the blades and remove the damage. Next the divers cropped the blades and ground their edges to give them the correct shape. The two undamaged blades also needed to be cropped using the exact same cutting line to give the propeller back its balance.

When the cropping was complete, the Hydrex technicians buffed the blades to make sure that any remaining loss of efficiency would be minimal.

Blade modification does not need to wait until drydock

We offer repair services, but can also help customers when they have the need for preventive or other special custom projects.

A good example of this is the project that was carried out on two sister vessels. These 229-meter bulkers were going to sail at a lower RPM. A modification of the propeller blades' diameter would allow to save fuel while doing this.

We mobilized a team to carry out the modifications while the ships were afloat. One operation was done in Rotterdam, the other in Amsterdam. In both cases they were performed without disrupting cargo operations.

Hydrex underwater inspections

Underwater inspections are an essential aspect of ship repairs. Building upon conventional technical skills and know-how while also taking advantage of the latest technology, Hydrex offers a unique hull monitoring service to its customers. This gives ship owners total control of the underwater hull and the underwater gear of their vessels. An informed decision can then be made concerning any required follow-up action. Catching problems early can save you much money in the long run.

Hydrex diver/technicians can carry out inspections underwater and on-site very swiftly without disturbing the vessel's sailing schedule.

With fuel costs amounting to 40% of operational expenses and continuing to rise, reducing fuel consumption is a vital concern of ship owners. This is the reason why hull monitoring pays for itself. Underwater hull roughness, marine fouling, bent propellers and poor paint condition are all factors that will increase fuel usage due to the drag or inefficiency created by the damaged or affected area. The data gathered can then be used to see if actions are required.

Our diver/technicians are trained for a wide range of operations and they can carry out the inspections in port or at anchor anywhere in the world.

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Modified propeller blade of bulker in Rotterdam.

Another example are the preventive modifications that we made in Bremerhaven to the blades of three ice-going vessels. This was done by modifying the blades to a very specific design that made them less prone to damage while keeping the performance of the propeller as close to optimum as possible. The operation was performed in close communication with the manufacturer of the propellers.

Conclusion

Over 45 years of experience with propeller repairs have given us the tools and know how to offer fast repair and modification services to vessels around the world. All types of operations can be carried out fast, fluently and efficiently afloat and underwater. ■

Cropped pieces of propeller blade of bulker.

Scrubber pipe repairs and lasting protection

Exhaust scrubbers filter out all harmful toxins from exhaust gasses of marine diesel engines. These hazardous pollutants can severely corrode the pipes of the scrubber. Using the experience we have accumulated over the years allows us to assist you at moment's notice if this happens.

We offer a full package to owners that are experiencing similar damage. Not only can we replace the corroded exhaust pipe while your vessel stays on schedule, but we can make sure that you will not have to call us again in a few months time for the same problem.

Contact us for more information on scrubber pipe replacements or other underwater repairs. We are at your disposal 24/7.

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Sail safe with Hydrex

This drawing was made in 1979 and symbolizes our care and attention for ships.

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