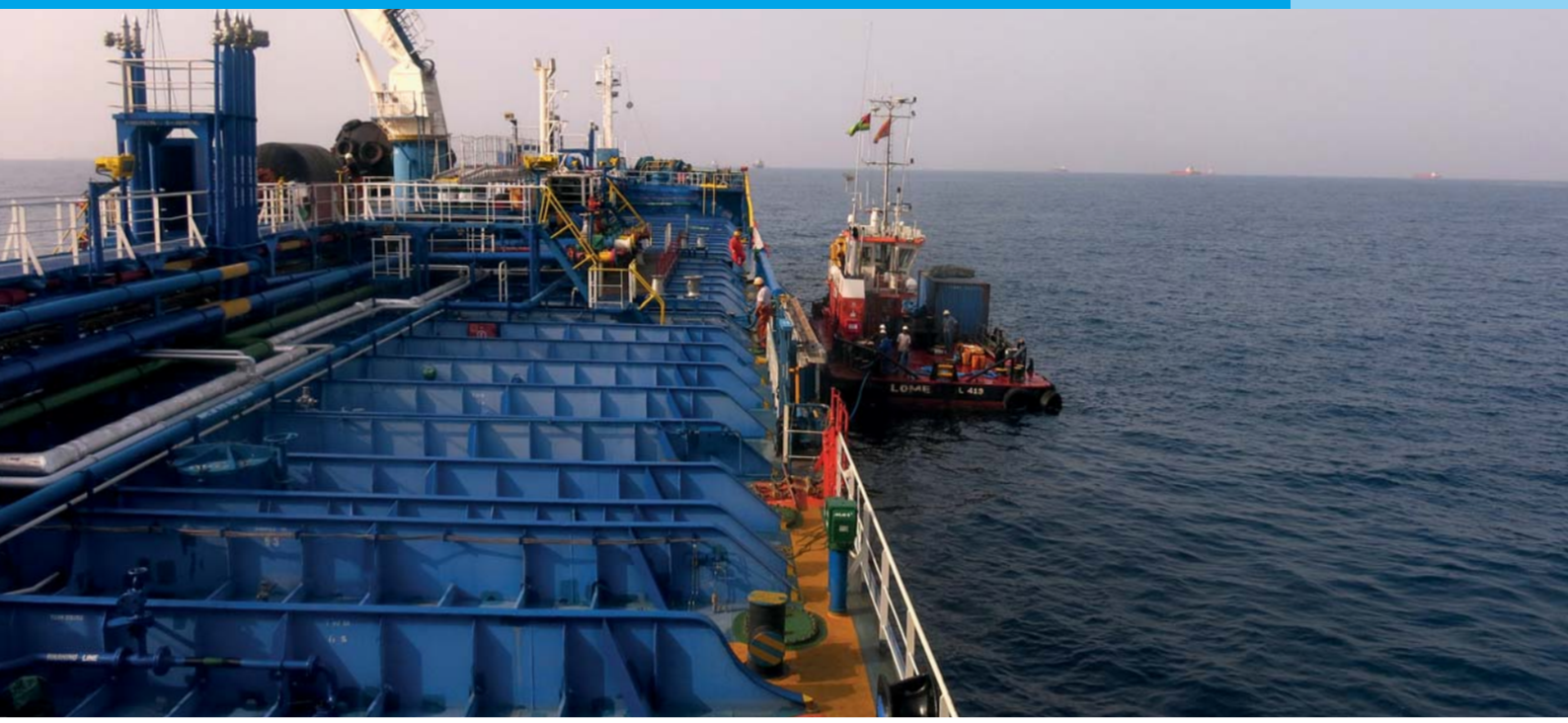
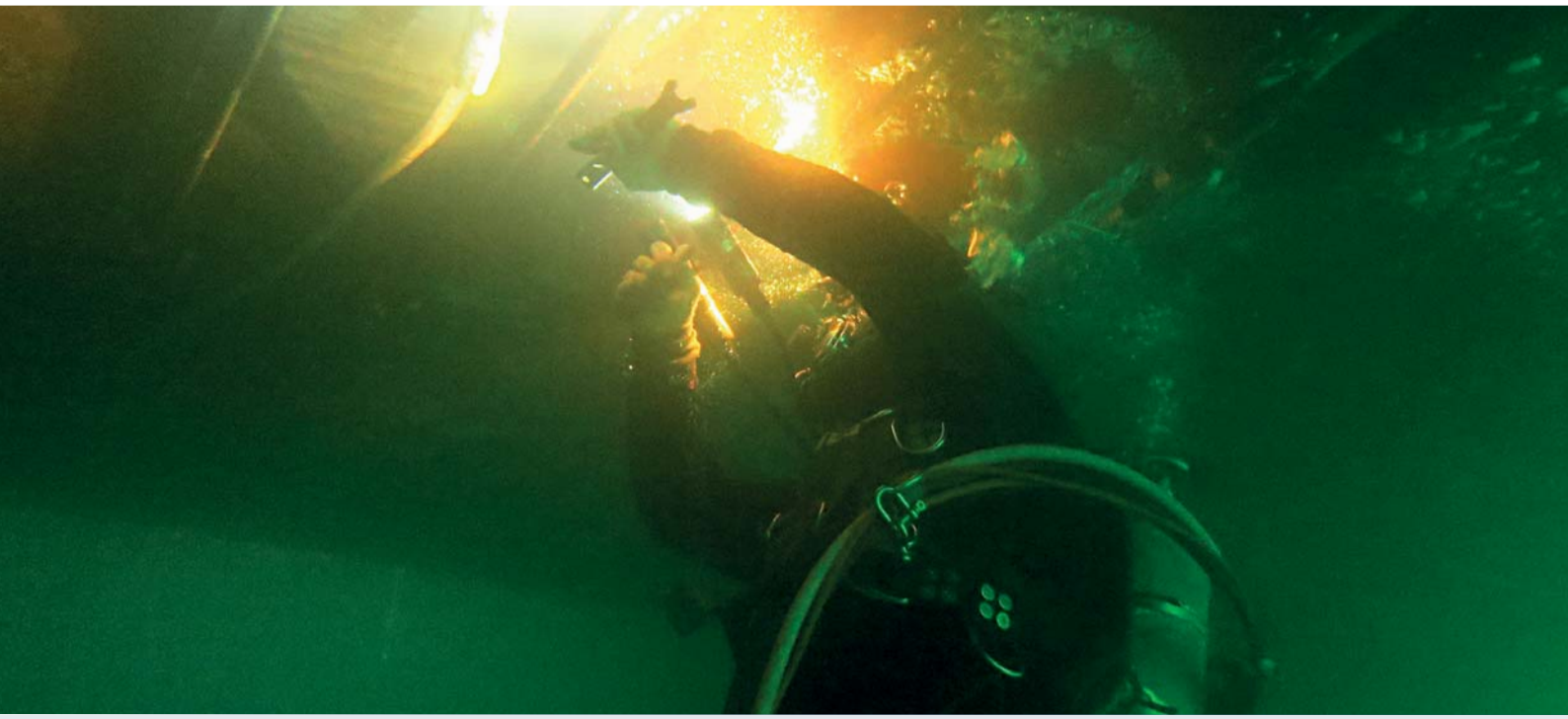
HYDREX®

UNDERWATER TECHNOLOGY

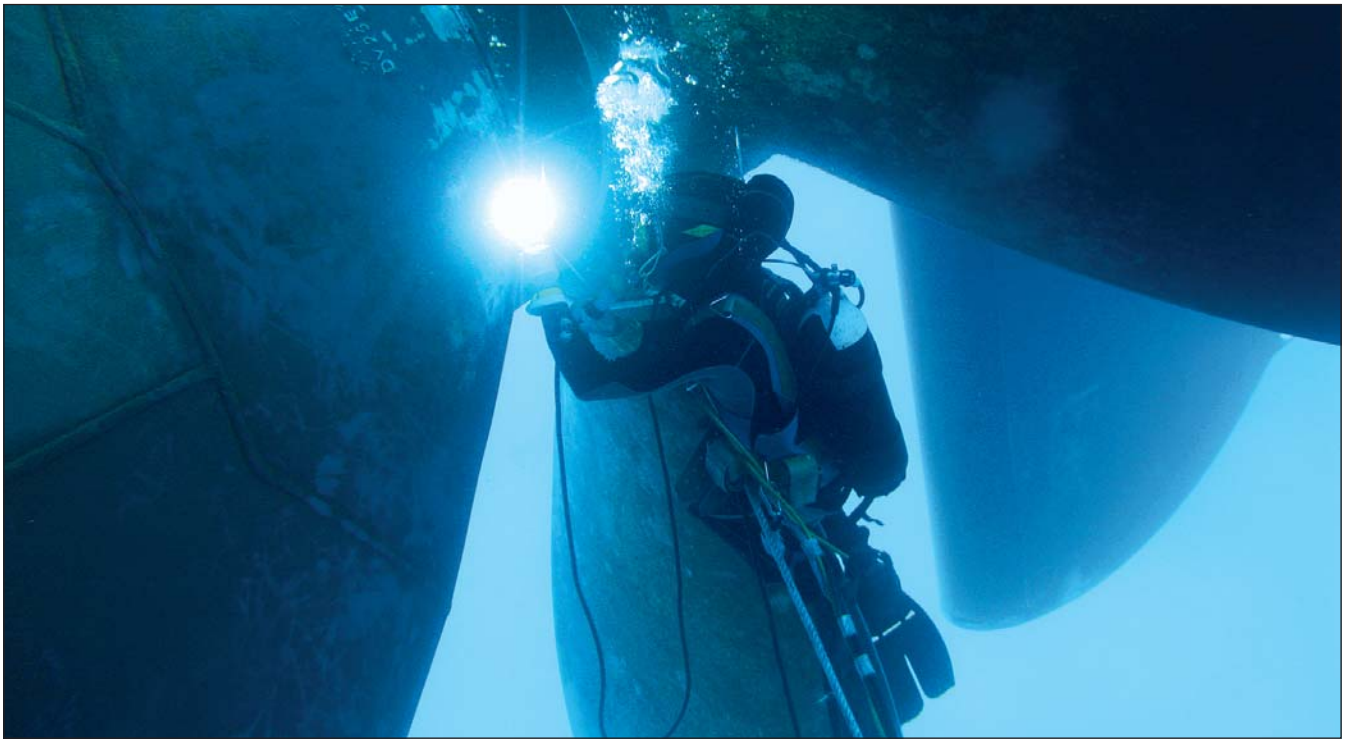
Magazine

Number *241*





Hydrex US ready to mobilize immediately



Hydrex has an office located in Clearwater in the Tampa Bay area that is ready to mobilize immediately. The office has a fast response center that is equipped with an extensive range of state of the art logistics, trucks, tools and diving support equipment. This enables Hydrex US to efficiently service vessels and offshore units calling on ports in Canada, North, Central and South America as well as the Caribbean.

All staff members of the Hydrex office in Clearwater undergo stringent training at the Hydrex headquarters in Antwerp. They can carry out both simple and complex high quality jobs even in the harshest of circumstances.

Repairs to thrusters, propellers, rudders, stern tube seals, damaged or corroded hulls and all other underwater repair as well as maintenance services are done while the vessel is afloat. This eliminates the need to drydock.

All used methods are fully approved by all major classification societies.

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Editorial

The first article in this month's magazine talks about a range of propeller operations carried out by our teams around the world.

Propeller blade straightenings were performed in Italy and Togo, while in Belgium and Singapore severely damaged blades were cropped. Further propeller blade modifications were carried out in Tenerife. Some of these repairs were done back to back and showcase perfectly how Hydrex can deliver fast services at any location without loss of quality.

Further on in this magazine you can find an overview of the many different underwater services we can perform to keep your vessel afloat and on schedule. All these operations can be carried out at any location around the world by our experienced teams.

The last article describes two very different hull plating repairs carried out by our divers. In Zeebrugge an emergency repair was needed after a roro vessel collided with a quay wall. In Curaçao a special cofferdam needed to be designed and constructed that could be installed onto an aluminum support vessel without welding.

If you would like to learn more about Hydrex services, please visit our website (www.hydrex.be) or call us 24/7 with your underwater repair needs, routine or emergency.

Hydrex founder
Boud Van Rompay

HYDREX N.V.
On Time Worldwide High Quality Underwater Services

ISO 9001 certified

Underwater services and technology approved by:

To receive a free copy, e-mail to: hydrex@hydrex.be

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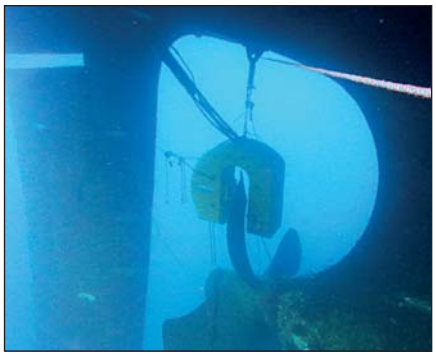


Hydrex performs propeller repairs around the world as winter arrives

Over the last couple of months our teams have traveled across the world to carry out cold straightenings, croppings and other propeller blade modifications on vessels in Belgium, France, the Netherlands, Italy, Spain, Togo and Singapore.

Hydrex van and equipment on the road to Italy for a propeller straightening.

Dave Bleyenberg, Hydrex Production Executive, explained: "While winter months usually result in an increase in propeller repairs, this normally occurs between January and March. But we already attended a number of vessel inspections on propeller blades broken or damaged by ice or debris in the last months of 2016."

Returning bent blades to their original form

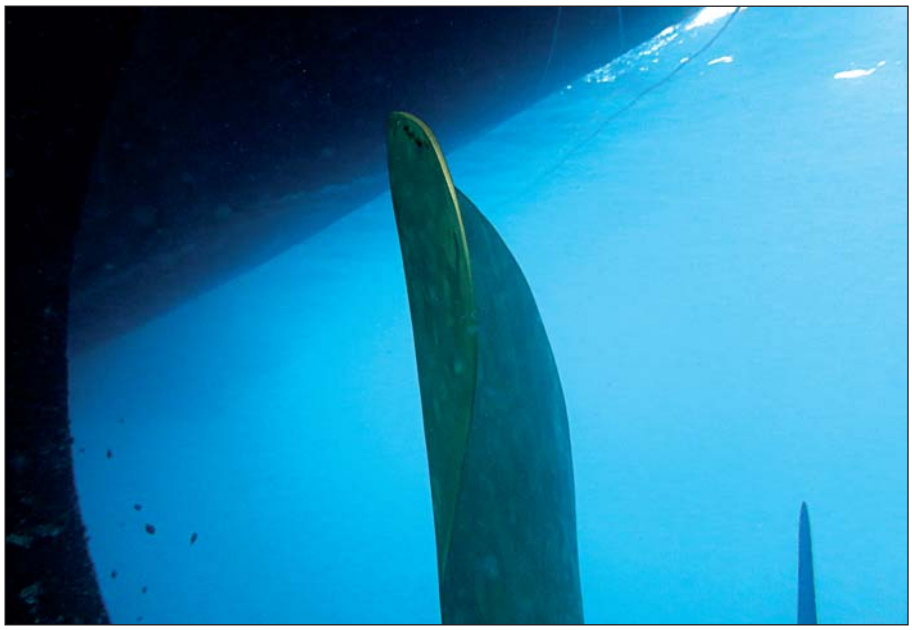
In November, a Hydrex team was called out to Taranto, Italy, to inspect a 27,500dwt general cargo ship. Its engineers had reported excessive vibration from its five blade, 5m diameter propeller as the vessel returned from operations. The cause of the vibration was two bent propeller blades.

Hydrex deployed its cold straightening equipment and a dive team to repair the blades without disruption to cargo operations and the vessel's ongoing schedule.

"After correctly positioning the cold straightening press over the propeller blades, they were bent back into shape," said Bleyenberg. "While dive teams were in-situ repairing the propeller, Hydrex personnel ashore monitored video links from underwater cameras on the divers' equipment. This allows us to communicate the exact dimensions and position of the damage between the divers and the technical team supervising the operation. This is essential because the calculations need to be perfectly accurate to achieve the best results in terms of propulsion efficiency."

No sooner had the propeller been repaired or the dive team and cold straightener deployed to Togo, West


Hydrex team members setting up equipment next to general cargo vessel in Taranto.



One of the bent propeller blades of a tanker berthed in Togo.

The bent blades were restored underwater with our cold-straightening machine.

Workboat with divers and equipment next to tanker in Togo.

Hydrex under-water 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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Permanent in-water rudder repairs now possible without drydocking

Hydrex has developed an entirely new method enabling permanent repairs of rudders without drydocking the ship. Permanent repairs were hitherto not possible and ships had to drydock in case a major defect was found. The newly designed equipment is light-weight and can be mobilized very rapidly in our special flight containers. Therefore this new service is now available world-wide.

Major defects on rudders very often cause unscheduled drydocking of ships. The new method designed by our technical department allows engineers, welders and inspectors to perform their tasks in dry conditions. Class approved permanent repairs on-site, without moving the ship, are now possible and commercial operations can continue. Steel repairs and replacements can be performed and pintle and bushing defects can be solved without the loss of time and money associated with drydocking.

The equipment can be mobilized within hours to any port in the world and is available for rapid mobilization from the Hydrex headquarters in Antwerp.

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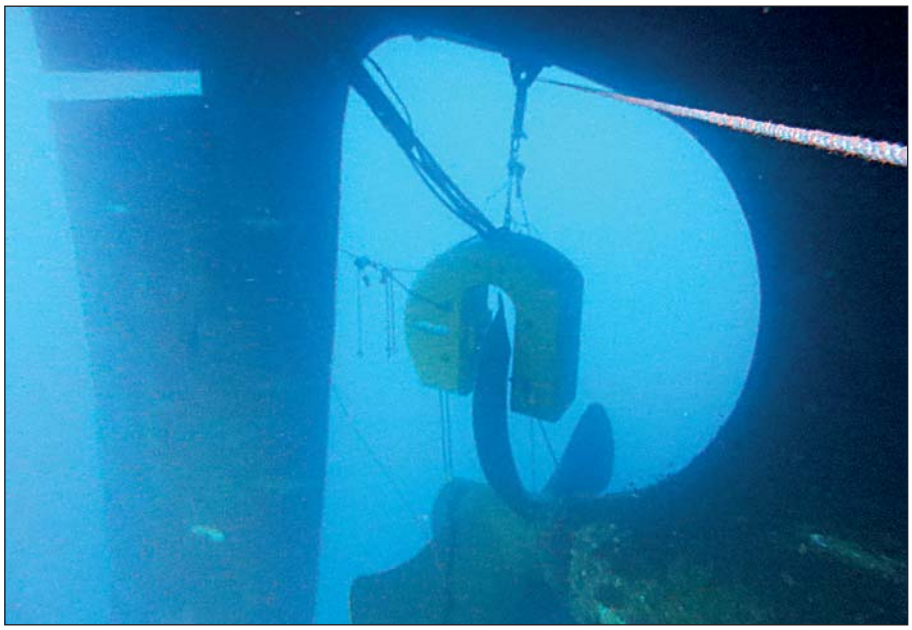


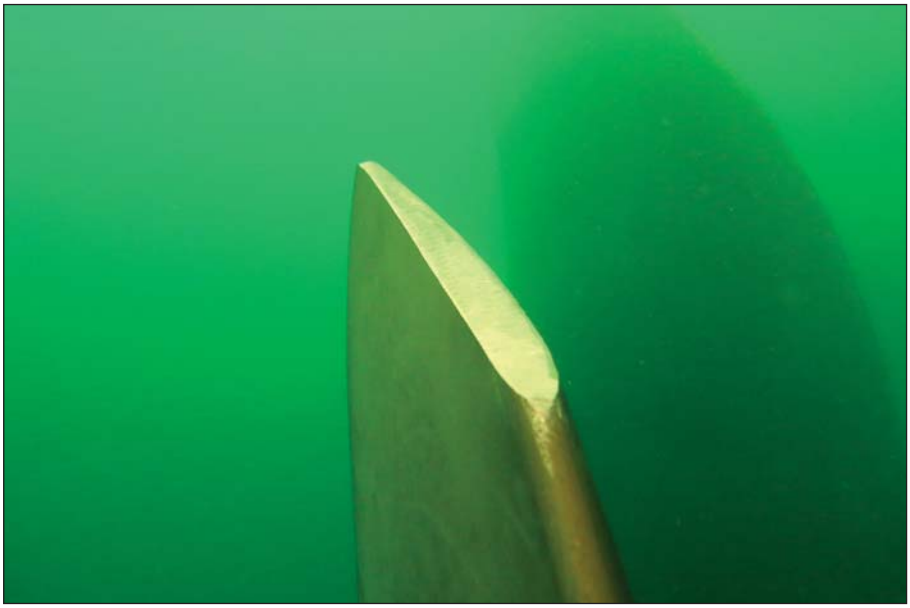
Cold-straightening equipment positioned over bent blade.

The bent blades of the tanker were restored to their original form.

Detached stainless steel belt that damaged the propeller blades of a tanker.

Polished blade of tanker after cropping in Antwerp.

The five equally cropped blade pieces of container vessel in Singapore.



The edges of the cropped blades were polished to optimize efficiency.

Africa, to carry out a similar operation on a tanker whose propeller was vibrating due to a bent blade.

Cropping severely damaged blades

While these two call outs have involved the repair of bent propeller blades, if straightening is not an option, the damaged area of the blade can be cropped and grinded to restore hydrodynamic balance.

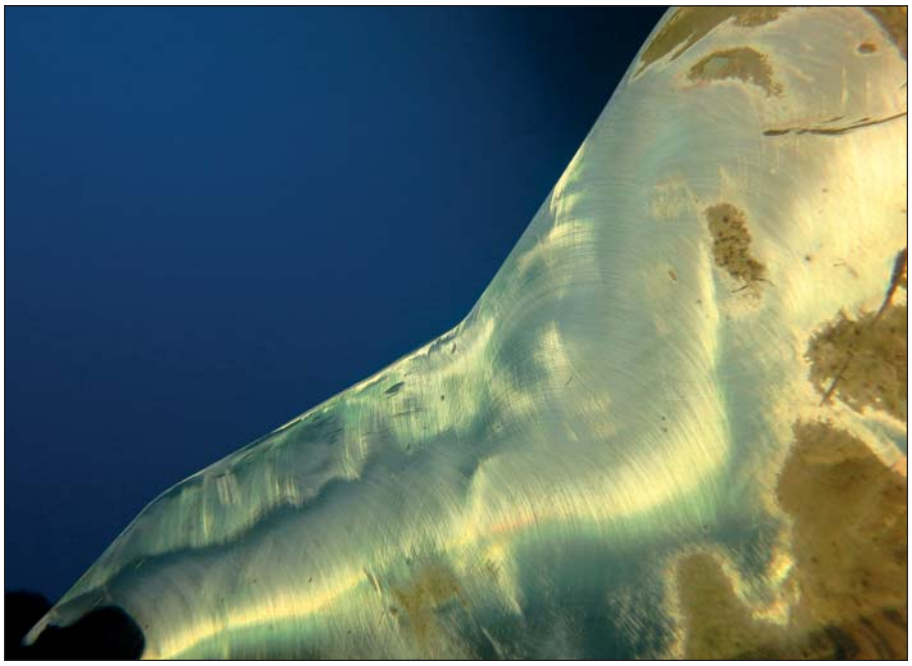
This was done during an emergency operation on a tanker berthed in Antwerp. A doubler plate installed on the inside of the propeller nozzle had partially detached itself and had severely damaged the four blades. First a detailed underwater inspection was carried out by our divers to assess the extent of the damage and to calculate the ideal cutting line. The doubler plate was then removed to prevent it from causing further damage. Next the four blades were cut underwater, grinded and polished using our patented blade repair tool.

“If five-bladed propellers are damaged, the repair is more complex as extensive calculations have to be made to take the right amount off each blade to restore balance and prevent vibration,” said Bleyenberg.

An operation of this kind was carried out by one of our teams on a 184-meter container vessel in Singapore. Balance was restored to the propeller after all five damaged blades had been cropped.

“We often encounter blades that have been severely damaged, chipped or almost completely broken off during ice navigation. In most instances, they can still be repaired in-situ by grinding and cropping the blades.”

Nicked propeller blade of tanker in Tenerife.



The cracks and nicks were grinded out and the edges polished.

Wide range of propeller modifications

Luckily, the damage to the propeller blades is not always so extensive and a less comprehensive repair is required, as was the case for a 183-meter tanker in Tenerife.

An underwater inspection revealed that two of its propeller blades had suffered smaller cracks and dents along their trailing edges. Because the damage to the blades was limited, the ship experienced no vibrations and only a small loss of performance. Our divers therefore grinded away the cracks and polished the edges of the blades. This gave the propeller back its original efficiency and prevented further cracking.

Hydrex can also provide prescriptive propeller maintenance. When a containership suffered propeller damage after a particularly severe winter, the owner wanted to find a way of preventing ice-damage to propellers on other vessels in the fleet.

"We strengthened the blades with modifications based on a specific design developed in cooperation with the original equipment manufacturer," said Bleyenberg. "The strengthening made them significantly less susceptible to ice-impact and debris, without detriment to the propellers' performance."

Conclusion

Over forty 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 and this afloat and underwater.

Please contact us if you need more information on propeller or other underwater operations. We are ready to assist you 24/7. ■

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:
hydrex@hydrex.be
or at
+ 32 3 213 53 00

KEEPING SHIPS IN BUSINESS

Stern tube seal repairs

Using our flexible mobdock method to create a dry underwater environment, we have carried out stern tube seal repairs and replacements underwater for some years now in cooperation with OEMs.

This technology brings drydock conditions to the ship rather than having to take the ship to drydock, saving a considerable amount of time and money in doing so.

This class accepted method is performed by our diving teams under our warranty. It can be used while the ship is carrying out its usual cargo or other commercial operations in port.

Visit the special stern tube seal repair section on our website for more information and examples of the many seal repairs we have performed in recent years.

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High quality in-water ship re

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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.

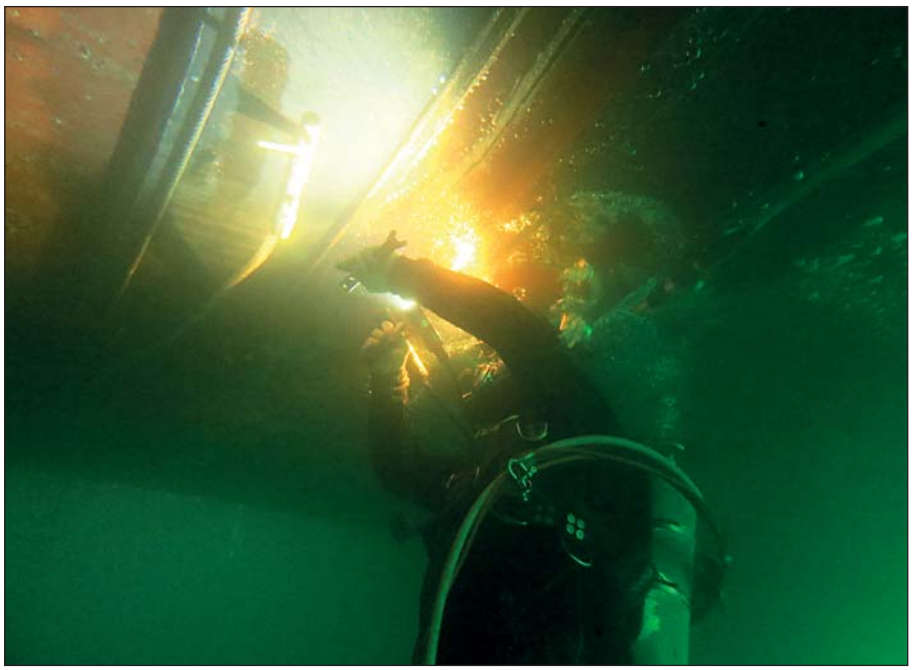
Propeller operations
Propeller cleaning with special tools, on-site blade straightening and cropping. Permanent repairs to all types of propellers or installation of propeller cone fins.

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

Pintle and bushing repair and replacements

Afloat hull repairs close at home and far away

Recently our diver/technician teams mobilized to vessels in Belgium and Curaçao for underwater hull plating repairs. In Zeebrugge a crack needed to be closed off and prevented from spreading further. For the operation in Curaçao a cofferdam had to be designed and constructed by us and then secured on the flat bottom of a fast support vessel.



Hydrex diver/technician during installation of cofferdam in Curaçao.

This would allow the local shipyard to perform extensive work on the shell plating of the vessel from the inside without putting the ship in the dry, as there was no space available in the yard. The difficulty lay in the fact that the support vessel was made of aluminum, which prevents wet welding work. Our R&D department therefore design a cofferdam that could be secured to the hull by other means.

The shipyard and the owner gladly accepted the proposal as it offered a fast and easy solution. Immediately after the operation was confirmed, a team mobilized to Curaçao. In the meantime the needed technical information was sent to our local support base. They took care of the construction of the cofferdam so that it would be ready when our team arrived on-site.

The team set-up a workstation on a workboat next to the vessel and then started the installation of the cofferdam. After it was secured, the crew of the shipyard could start the onboard repair work on the hull plating.

Two cofferdams were secured to a support vessel without welding.

The hull of the ship had been damaged in two locations and initially the plan was to move the cofferdam after the first area had been repaired. Because of the deformation of the bottom plating it was however decided to construct a second cofferdam and cover up both damaged areas at the same time. Our teams are trained to effortlessly adapt themselves if the scope of work changes. Working together with our local support base for the material, they quickly made the additional cofferdam and secured it to the shell plating.

The shipyard needed to perform work on the shell plating from the inside while the vessel was afloat.

Newly installed frame.

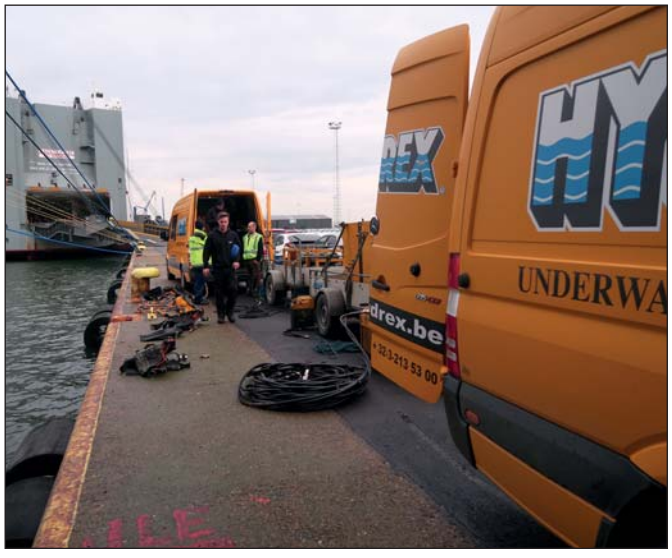
The shipyard could then carry out all needed repair work on the shell plating in ideal circumstances without having to put the vessel in the dry, much to the satisfaction of the owner who did not have to wait for a space to become available.

Emergency crack repair

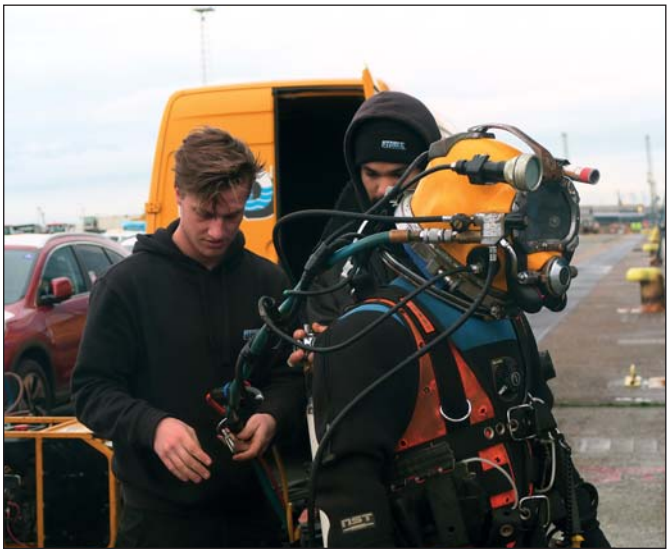
Our divers are also certified welders and they can take care of any wet or dry welding work required for an operation, as was the case during the hull repair in Zeebrugge.

A roro vessel had collided with a quay wall and the owner contacted us to perform an inspection of the damage as well as any needed repair. A team immediately mobilized from our headquarters in Antwerp.

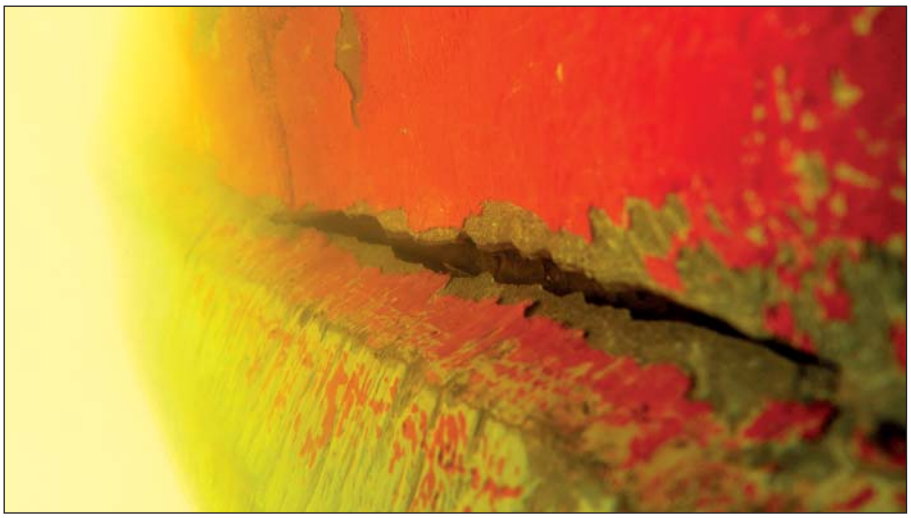
The operation started with a detailed underwater inspection of the damage. This revealed a 780 mm long crack on the bulbous bow, two meters under the waterline. Crack arrests were drilled on each side of the crack to prevent it from spreading further. A 850 mm x 60 mm doubler plate was then positioned over the damage and secured with wet welds.



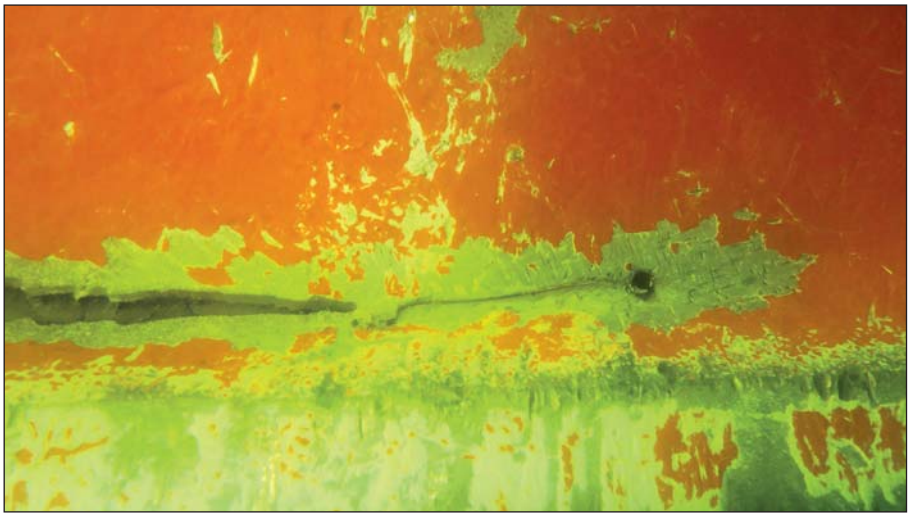
Hydrex team and equipment during crack repair in Zeebrugge.



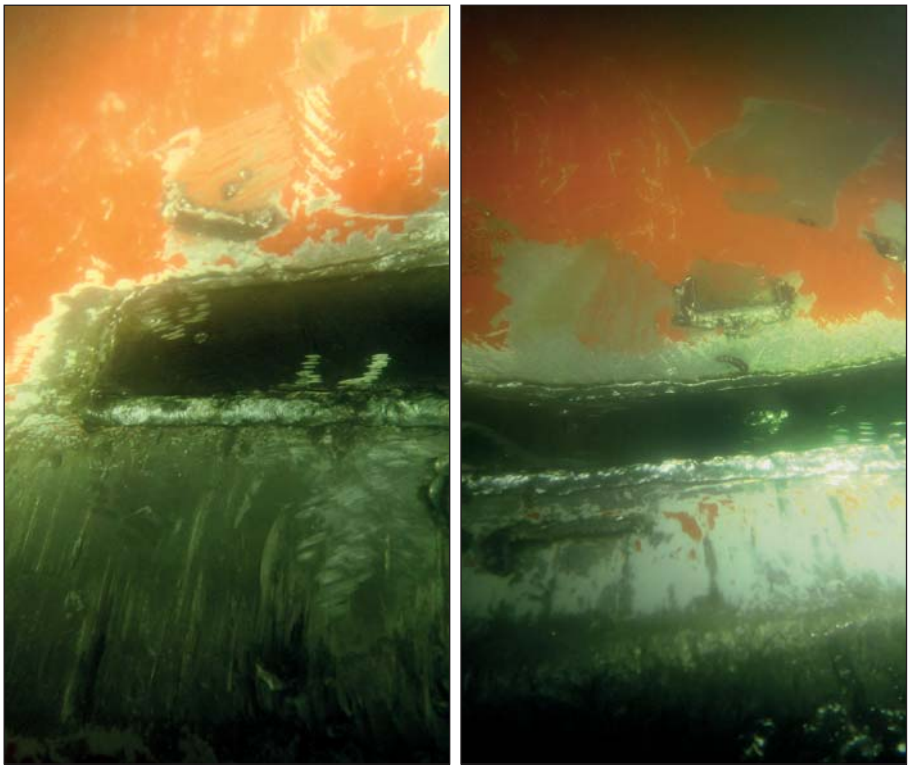
Diver getting ready for underwater operation.



Crack on bulbous bow of roro vessel after collision with quay wall.



Arrests were drilled on both ends of the crack.



A doubler plate was installed over the crack.

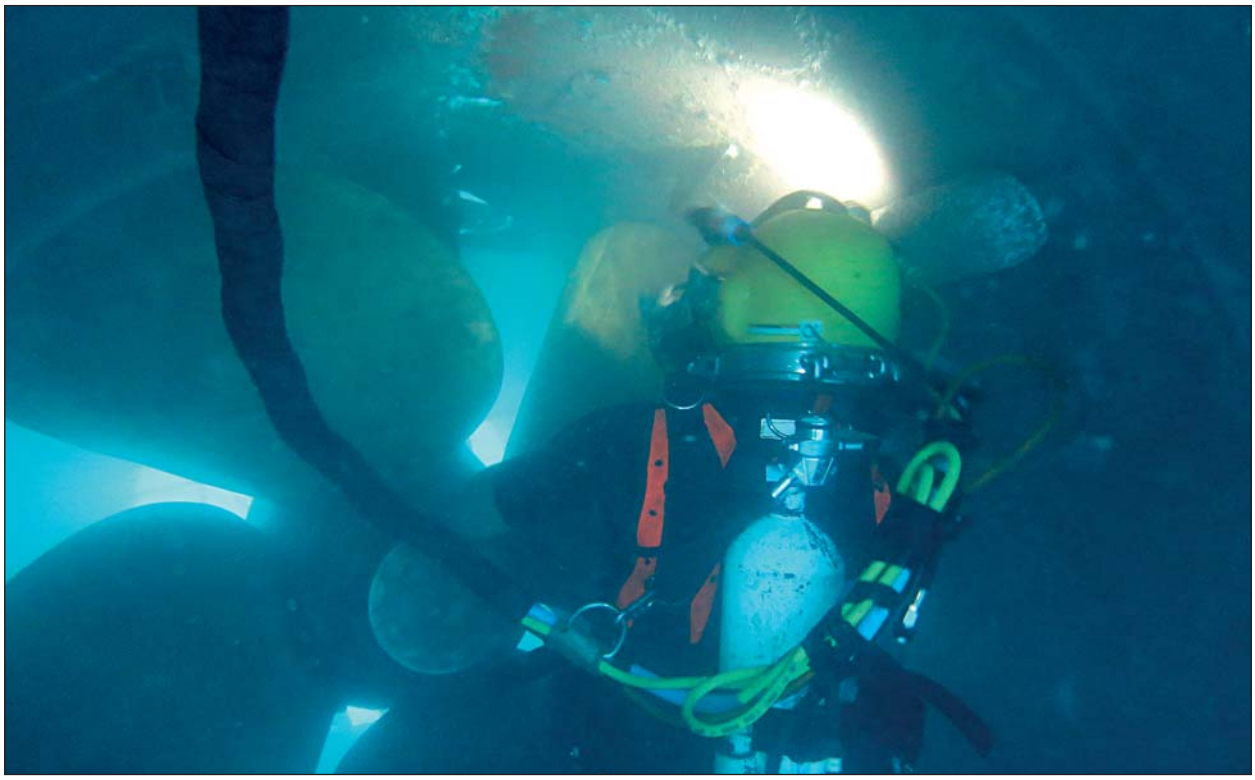
Measuring the width of the crack.

A leakage test confirmed that the operation had been successful and the repair was approved by the classification society. This allowed the owner to keep the roro vessel sailing until the next scheduled dry-docking.

Conclusion

We have the know-how and experience needed to find the best solution for any problem you might encounter with your vessel. This can be a simple routine repair or a unique complex one, as illustrated by these case studies. We can easily adapt a repair to your schedule. If required we can split up an operation and perform it in parts on different locations. Our goal is to keep you sailing with as little delay as possible. ■

Swift on-site bow thruster operations



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.

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Keeping ships in business

Hydrex offers turnkey underwater repair solutions to shipowners wherever and whenever they are needed. Hydrex's multidisciplinary team will help you find the best solution for any problem encountered with your ship below the water line. We will immediately mobilize our diver/technicians to carry out necessary repair work without the need to drydock.

Hydrex has a long track record of performing complex permanent underwater repairs to thrusters, propellers, rudders, stern tube seals and damaged or corroded hulls. By creating drydock-like conditions around the affected area, our diver/technicians can carry out these operations in port or at anchor.

All the projects we undertake are engineered and carried out in close cooperation with the customer and any third party suppliers, relieving the customer of all the hassle of coordination, planning and supervision.

Headquartered in the Belgian port of Antwerp, we have offices in Rotterdam, Tampa (U.S.A) and Algeciras (Spain).

All Hydrex offices have fully operational fast response centers where an extensive range of state-of-the-art equipment is available at all times.

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