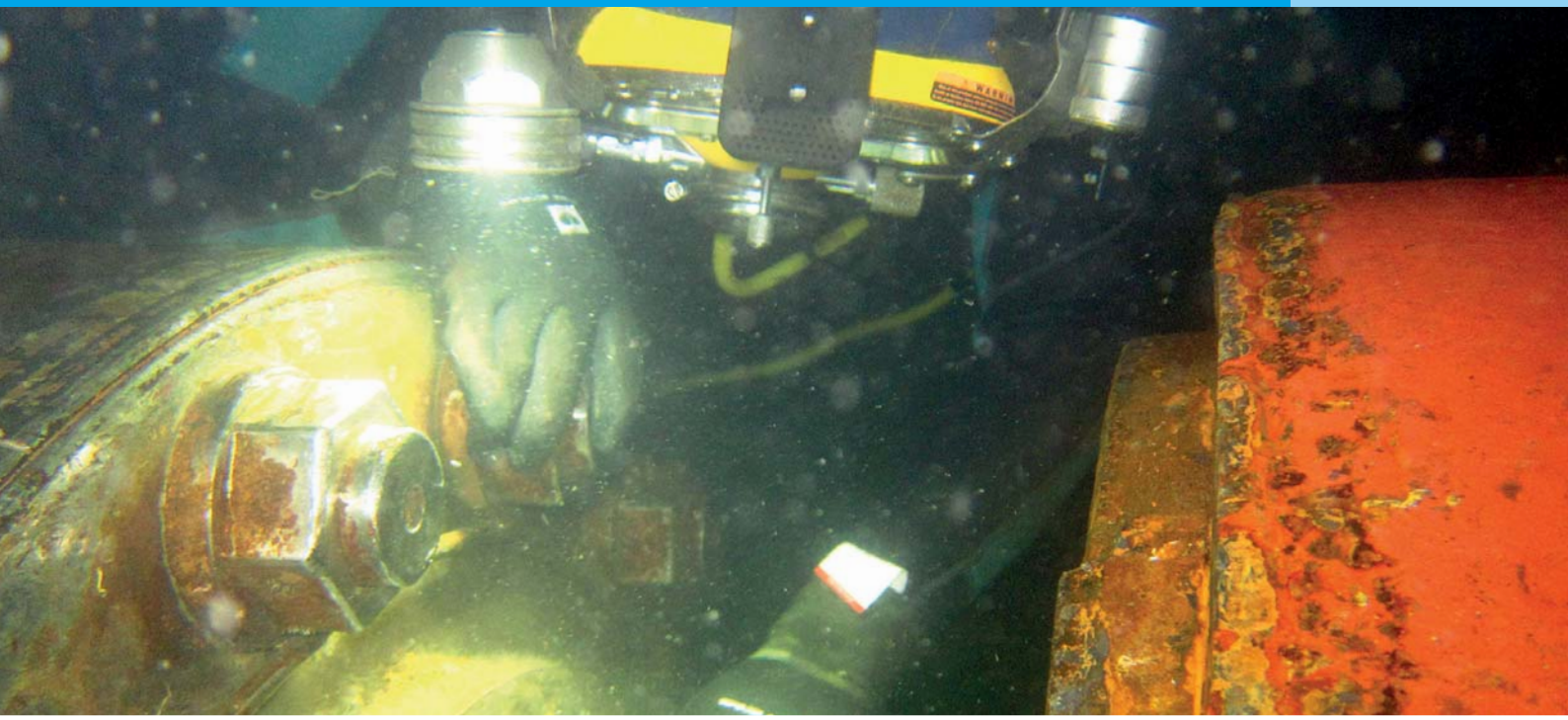
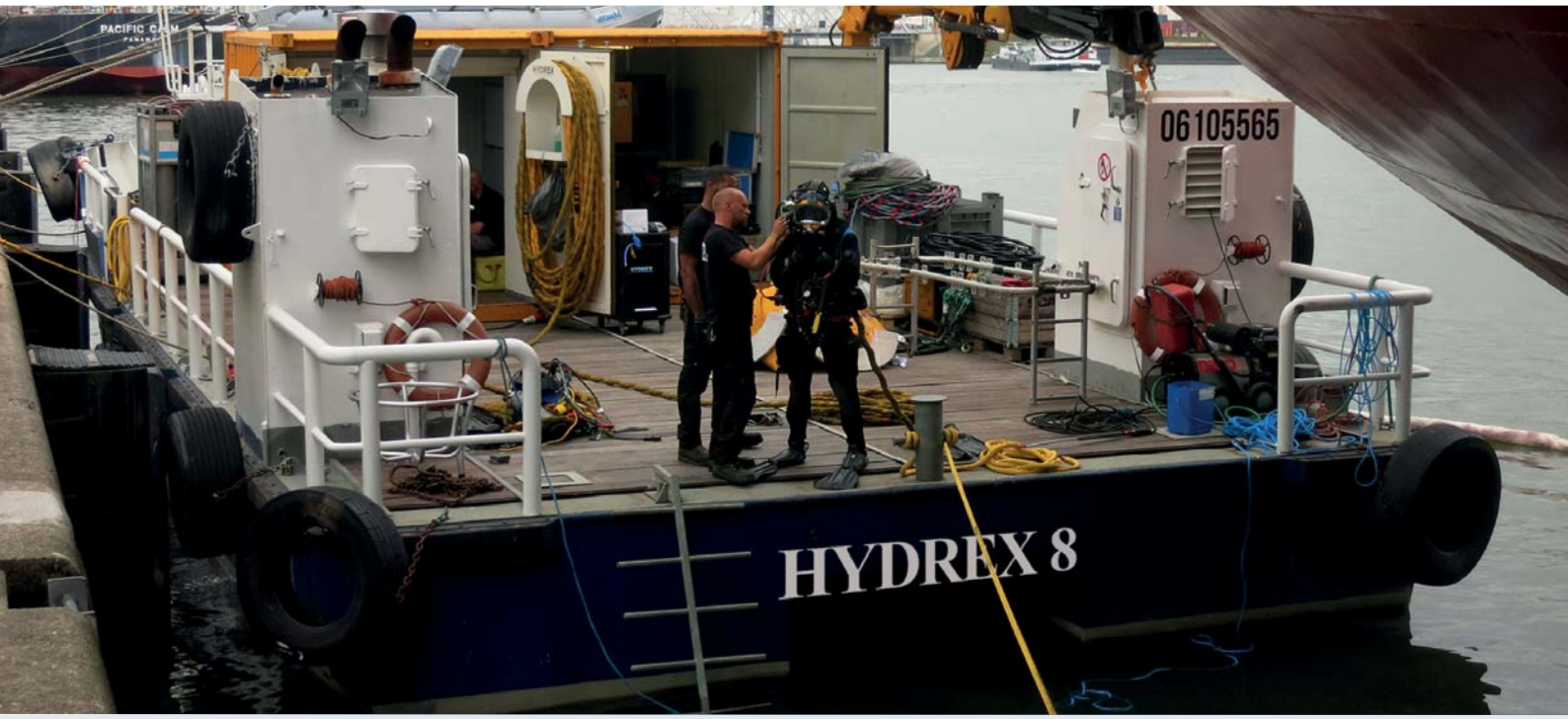
HYDREX®

UNDERWATER TECHNOLOGY

Magazine

Number *243*





Hydrex hull repairs save time and money

Hydrex on-site hull repair services include the renewal of both small and large areas of damaged hull plating. These repairs can be carried out above or below water, according to the circumstances, with tailor-made cofferdams. Normal commercial activities can therefore continue without disruption. These operations follow the Hydrex procedure for welding cracks in the vessel's shell plating and they are approved by all major classification societies.

Hydrex diver/technician teams carry out these on-site hull repairs all over the world. In most cases the damaged area can be replaced with a permanent insert and no condition of class is imposed. On the rare occasions where the damage does not allow such a repair, a temporary doubler plate is installed over the affected area. This allows the owners to keep to their schedule and have a permanent repair carried out during the next scheduled drydock visit.

To offer the fastest possible service to customers, Hydrex offices have fast response centers where an extensive range of state-of-the-art tools and diving support equipment is available at all times for the repair teams to mobilize to your location.

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Editorial

Our flexible mobdocks can be used worldwide to perform a wide variety of operations. The technology was developed by our in-house R&D department. It allows us to create a dry environment underwater for our divers to work in.

The first article in this magazine deals with a specific use of this technology: Stern tube seal repairs. Besides a short history of how we developed this technique and the many advantages it offers, we also talk about some recent examples.

Next you can read about the large growth Hydrex has undergone in the last couple of years. This includes a brand new warehouse, the complete refurbishment of all the existing buildings, additional offices, the expansion of our dock space and a total overhaul of our workboats.

All of this enables us to keep on improving our services. Do not hesitate to call us when you need any repair or maintenance work performed. Hydrex has the means and knowledge to provide you with a fast and safe underwater solution.

Hydrex founder
Boud Van Rompay

Cover: Underwater shaft seal repairs around the globe in record time.

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

ISO 9001 certified

Underwater services and technology approved by:

BUREAU VERITAS
ABS
ISO 9001
ClassNK
ADC International
RINA
LR

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Underwater shaft seal repairs around the globe in record time

We have developed a flexible mobdock repair method that enables the underwater replacement of all types and sizes of shaft seals. This technology has been successfully used by our diver/technicians for over a decade. It allows ship owners to keep their vessel sailing, saving precious time and money.

Hydrex diver getting ready for underwater operation.

In 1998 our divers completed a seal repair training course led by John Crane Marine, who also worked together with Hydrex in the testing of new developments. At the end of 1999 we successfully started working with face type seals in Havant, near Portsmouth in England on what we considered to be the last barrier in replacing stern tube seals. It was a new and novel approach that was based on the strength of the mobdock (short for mobile mini drydock) applications that we had developed in the 70s, 80s and 90s.


Stern tube seal repairs can be carried out afloat with our flexible mobdocks.

Those early repairs were carried out on face type seals, that do not necessarily need a dry chamber or a dry habitat to work in. Soon it became apparent that we needed to find a solution for the lip type seals.

The next step was taken when we discovered it could be done with an inflatable habitat. This new flexible mobdock enabled us to do underwater stern tube seal replacements in the dry.

The first application for that particular type of operation was done on a cruise vessel. We replaced a 632mm diameter seal. This first success was a real breakthrough. After that it quickly became obvious that we could replace all types of seals. We

Hydrex diver working on the assembly inside the flexible mobdock.

performed ten more seals in the first year, for various manufacturers. These jobs went well: on each occasion the execution was done within the time frame that we had estimated.

It is not always straightforward to replace seals, because there can be quite a bit of variation in the configurations of the stern tube itself. There can also be complications with the liners, which can be worn down and show ruts. All this is routinely handled by our teams on the jobs.

In this article you can find a short summary of some of the recent stern tube seal repairs our teams have carried out. Like all shaft seal repairs we offer, these were performed in cooperation with the OEM. This allows us to provide our customer with original spare parts which guarantees the best quality material. We usually supply the equipment but the owner is free to supply his own OEM seals. We can handle all type of seals from all manufacturers.

Underwater repair in Uruguay under challenging circumstances

Oil was leaking from the stern tube seal assembly of a 157-meter dredger. A team of Hydrex diver/technicians therefore mobilized to the vessel's location in Uruguay, together with all the needed equipment.

The entire housing of the assembly was severely corroded and needed to be replaced. Because the housing consisted of split shells, this could easily be done by our team. The existing running area was also worn out. The divers therefore installed a spacer ring to create a new running area. Thanks to a newly developed method, this could also be done inside the flexible mobdock.

There was almost no inwater visibility at Montevideo at the time of

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 onsite 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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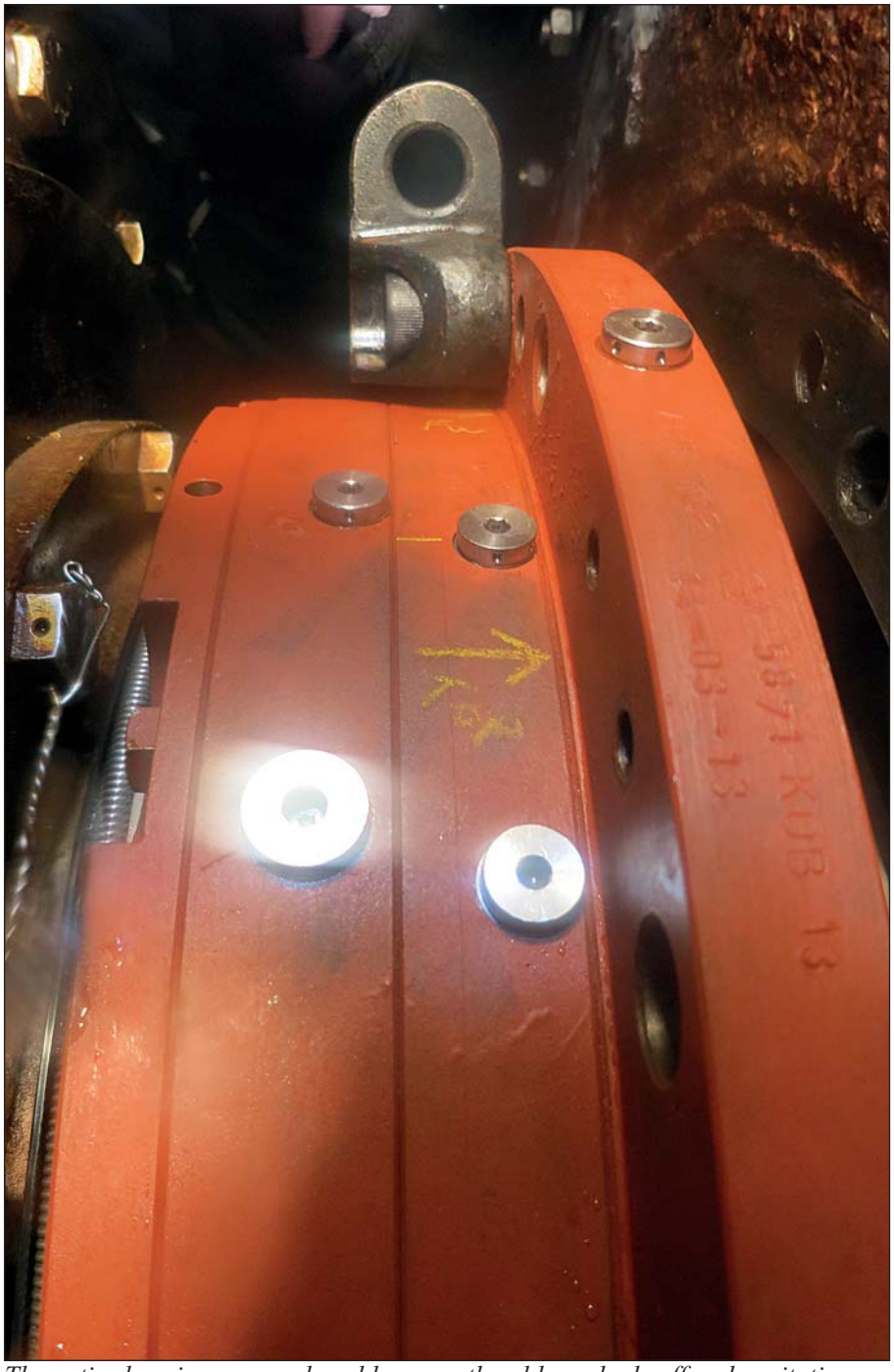
A line tangled around the assembly could have caused the leak.



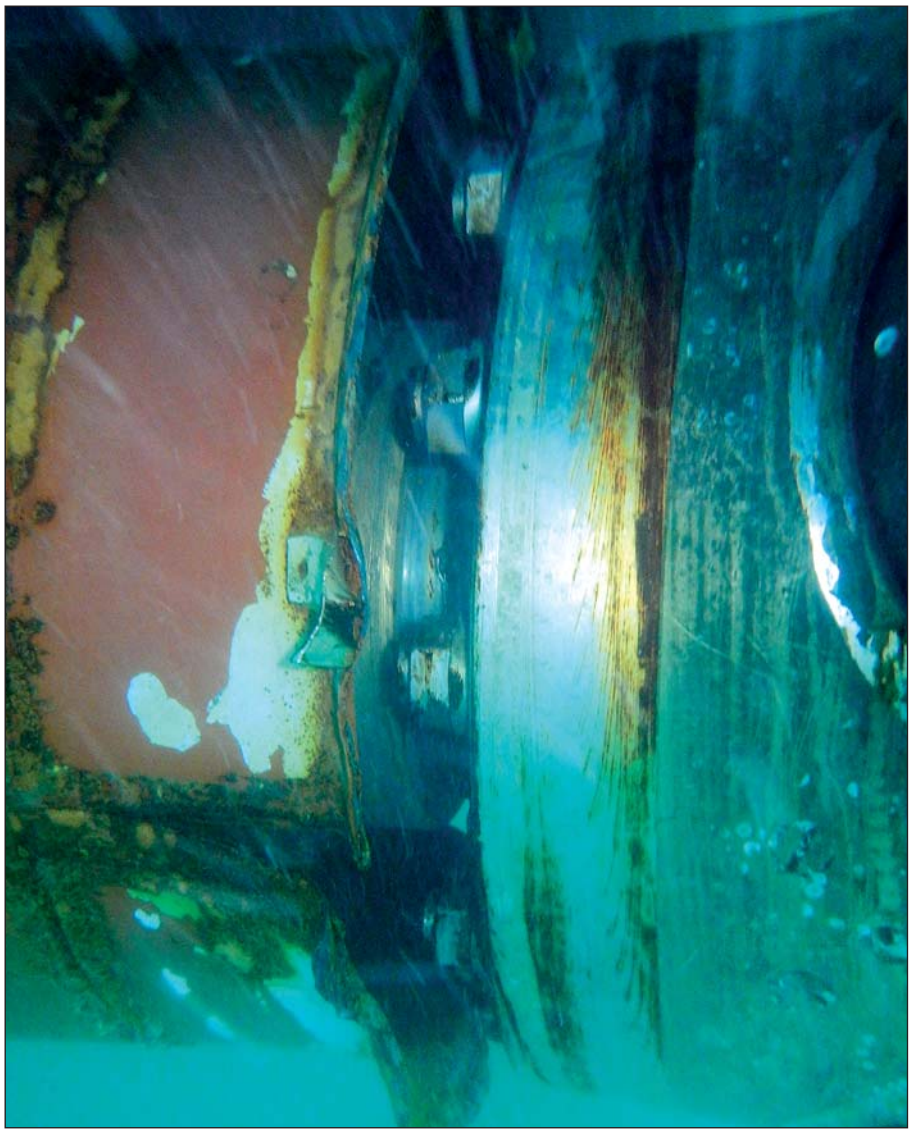
The entire housing was replaced because the old one had suffered cavitation damage.

the repair. Our teams are trained to be flexible and adapt to constantly changing working conditions. This made it possible for them to perform the repairs under the strictest safety regulations, to the highest quality standards and without any unnecessary delay.

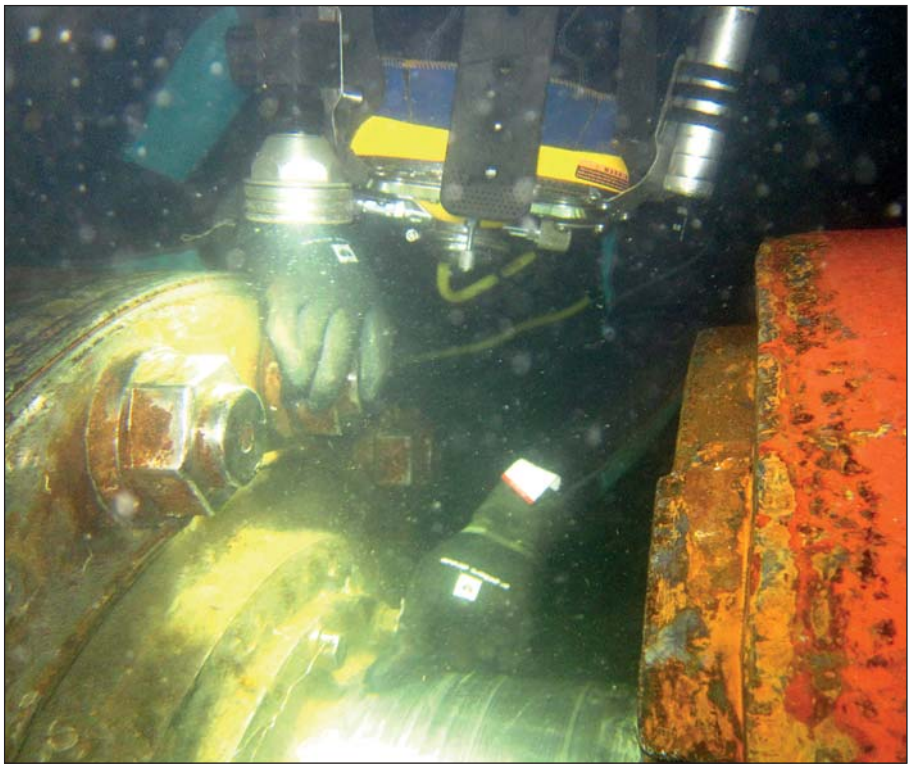
Complete renewal of stern tube assembly allows passage through Panama Canal

When a steel wire got stuck in the stern tube seals of a 156-meter vessel, it experienced a severe oil leak. The ship needed to pass through the Panama Canal to reach its next destination, but the leak had to be repaired before it was allowed to do so. We flew in a diving team immediately to carry out a fast underwater repair that would help the vessel continue its schedule.

A thorough underwater inspection revealed that the damage to the stern tube seal assembly was extensive. The rope guard was severely dented and the seal housing had been destroyed. Similar to the repair in Uruguay, both needed to be completely replaced. Because this stern tube seal assembly also consisted of a split type housing and liner, our team could carry out the entire replacement afloat.



Severely deformed rope guard prior to removal.



Hydrex diver inspecting damaged liner and running marks of the seals.

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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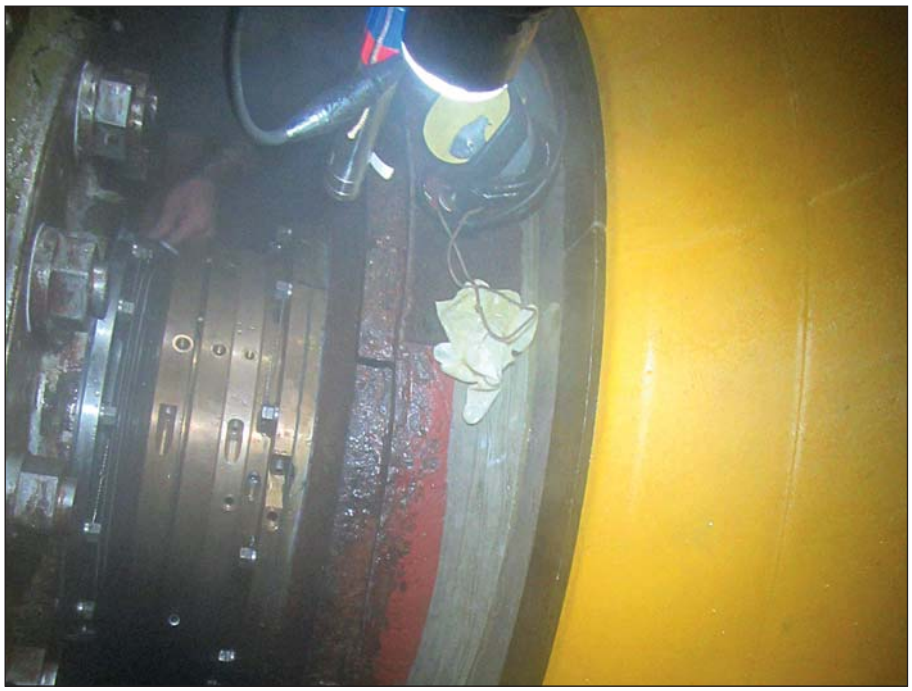


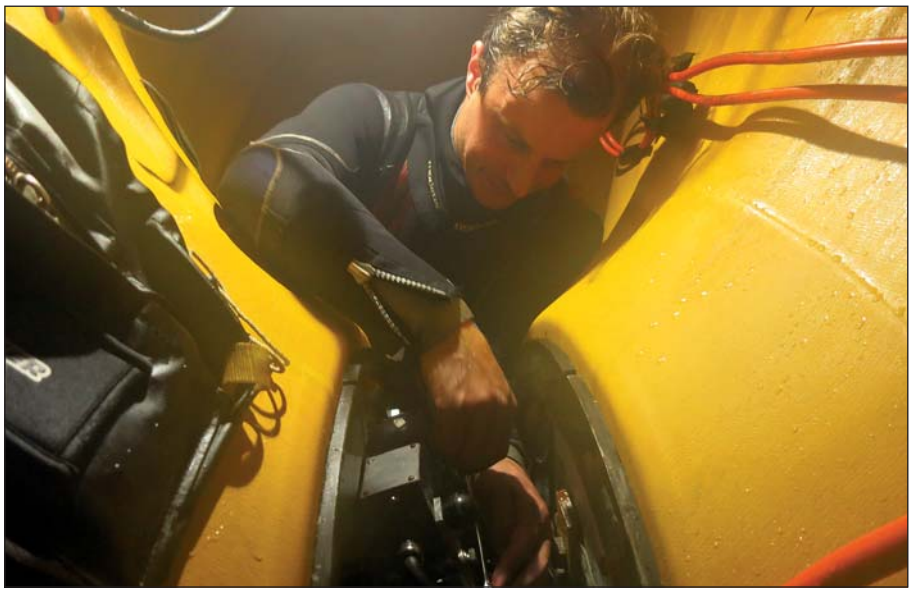
Finalizing the replacement in the dry working environment created by the flexible mobdock.

As a result of our many years of relationships with OEMs, we were able to arrange for spare parts to be sent to Antwerp immediately. An engineer of the stern tube seal manufacturer mobilized at the same time.

Because we have a very large stock of seal repair equipment stored in our fast response centers, everything needed for the replacement could be loaded on one of our dive support workboats as soon as the repair was confirmed. A team of diver/technicians then sailed to the tanker to start the operation.

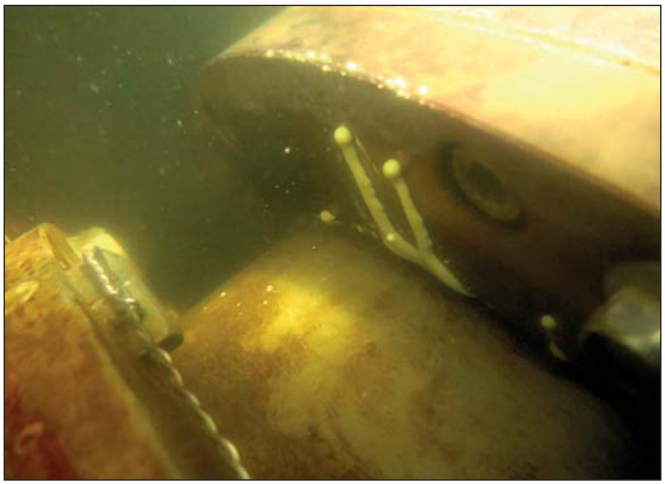
Ultra-fast response allows for emergency repair in record time

A 134-meter chemical tanker suffered a leak to its stern tube seal assembly while berthed in Antwerp. The Port Authority demanded that an underwater inspection was carried out and an on-site solution was found. We were contacted to perform the inspection and follow up repair in the absolute minimum amount of time.



Diver/technician working inside the flexible mobdock.

Hydrex lightweight equipment can easily be transported around the world.



An oil leak prevented the ship from sailing on.

By organizing everything from start to finish and in record time, the owner did not have to worry about making any arrangements for the repair. After the seals had been successfully replaced he could sail his vessel to her next stop without any unnecessary delay to the schedule.

Underwater shaft seal renewal in Australia

A Hydrex diver/technician team carried out underwater stern tube seal repairs on a 200-meter roro vessel in Port Kembla, Australia. The ship's stern tube was suffering an oil leak, making an on-site repair necessary.

Taking advantage of the Hydrex flexible mobdock technique the team was able to carry out the entire repair on-site and underwater. During the operation the team removed the three damaged seals and replaced them with new ones provided by the OEM.

Despite the remote location of the vessel, our technical department was able to arrange a rapid mobilization of a team and equipment to Australia. In the past we have carried out several important operations in Australia, among which an emergency stern tube seal repair on an offshore supply vessel in cooperation with Wärtsilä.

Conclusion

Every Hydrex office has a fast response center equipped with all the latest facilities, lightweight equipment and tools. This allows for a timely arrival of Hydrex teams on any location around the world with everything they need to successfully complete the job.

Damaged stern tube seals will cause an increasing amount of oil leaking or water ingress. By replacing the seals when the damage is first discovered, Hydrex keeps the down time low. The ship can keep its schedule as seal repairs can be performed during cargo operations. ■

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

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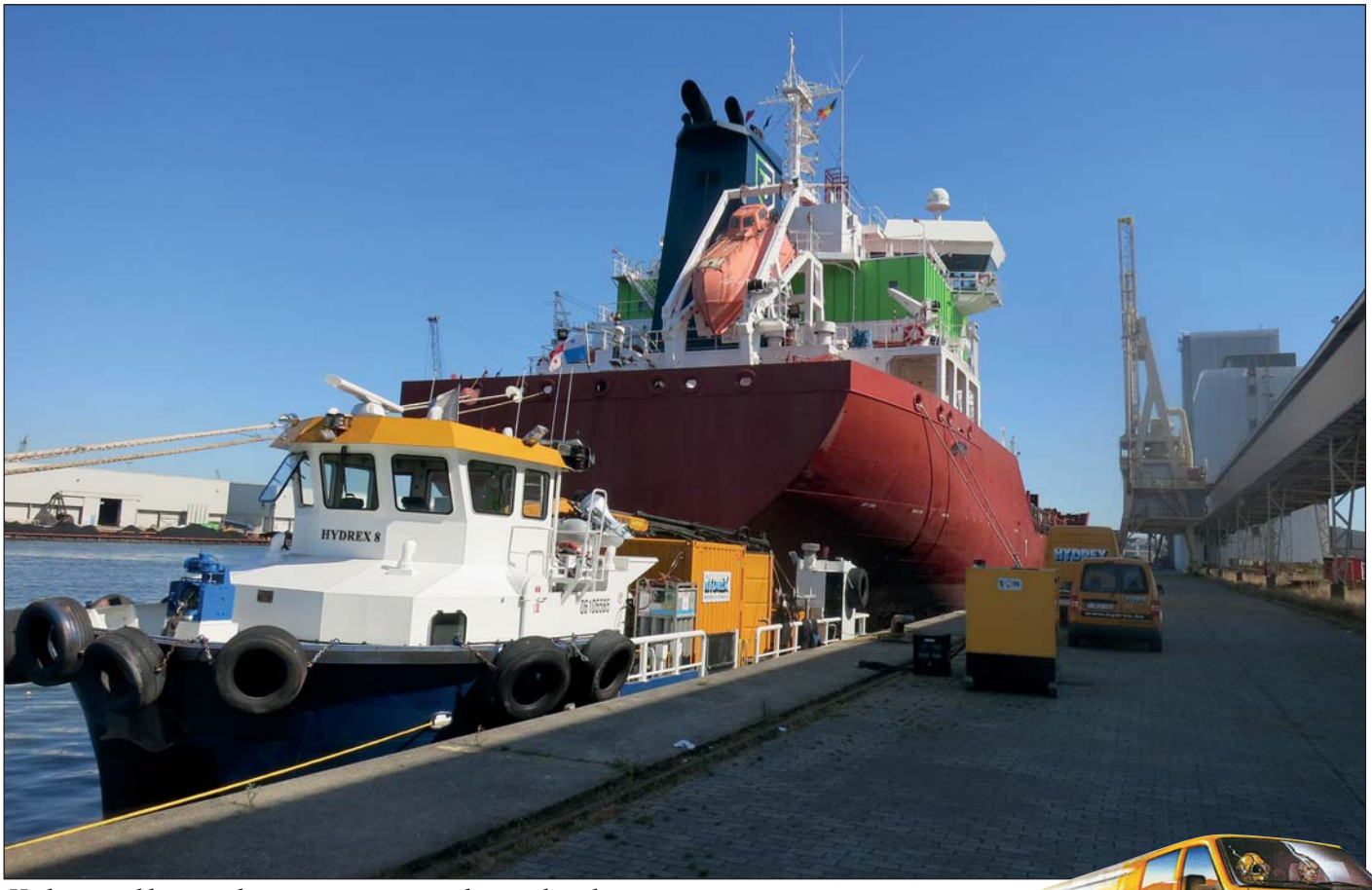
KEEPING SHIPS IN BUSINESS



Hydrex workboat and equipment next to chemical tanker.

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

Expanding Hydrex services even more

Since the company was founded in 1974, we have never stopped looking for new ways to assist ship owners. Our constantly growing range of services needs an equally full range of capable staff members. From the technical department doing the planning, over the R&D department handling the engineering aspect to the diver/technicians who carry out the class-approved operations.

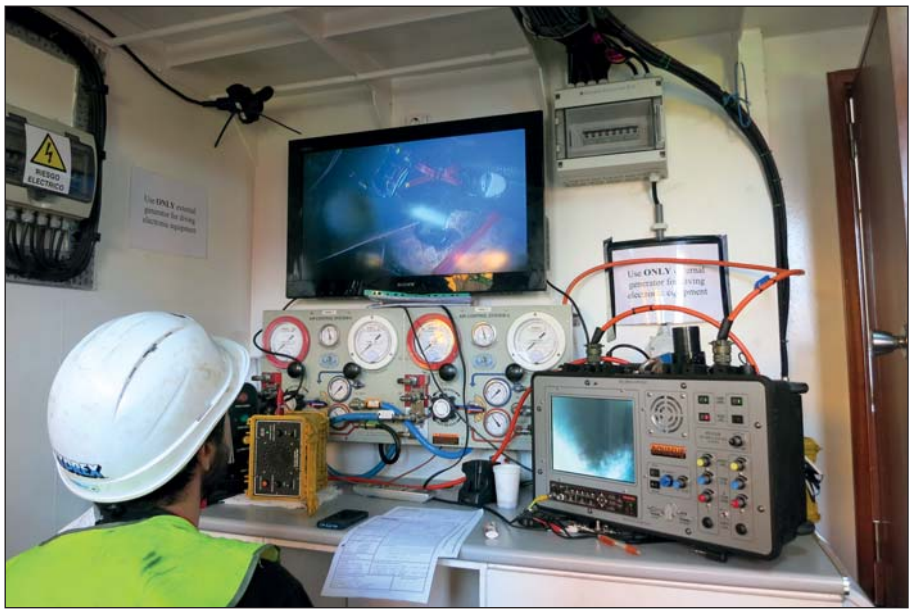
Preparing mobilization to a large repair operation.

New team members have been recruited in all areas, including a 25% growth of our diver/technician team. They need the best possible work environment to deliver the best possible quality for our customers. A largescale expansion was therefore the logical result of the growth we have undergone in the last couple of years.

New offices and meeting rooms are accommodating the staff of our headquarters. The existing offices and warehouses as well as the exterior of all buildings have also been refurbished. A totally new workshop has been added to the existing locations, bringing the total area covered to over 5.000 m².

A swift reaction remains one of the most important elements of our services. Our fast response centers are designed for immediate action whenever needed. They feature a diver training center with three diving tanks and a workshop for constructing equipment, tools or replacement items for underwater repairs.

Hydrex premises in Antwerp.

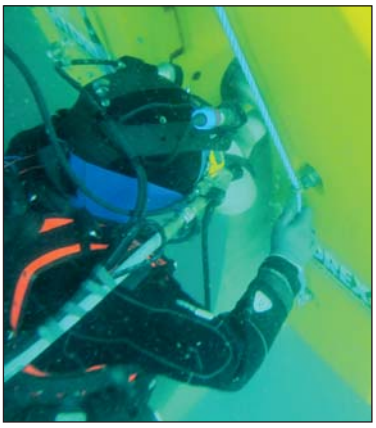


Hydrex team leader supervising an operation in one of our monitoring stations.

Hydrex workboat during an underwater operation.

Our well stocked warehouses allow for a fast response to any operation.

Fast underwater propeller blade straightening



In its quest to provide cost effective services to customers, Hydrex developed procedures to address different kinds of damage to propellers. This research led to the design of the Hydrex cold straightening machines first used in 2002.

By taking advantage of this technique damaged blades can be straightened underwater, allowing the ship to return to commercial operations without the need to drydock. Blades can be brought back close to their original form, restoring the propeller's optimum efficiency.

The cold straightening machines have been in use for quite some time now but the Hydrex research department has been looking into ways to expand the technique even further to improve our services. A new version of the straightening machine was recently put into practice. It is compatible with the existing models and is used to restore more severely bent propeller blades to their original condition.

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Part of our fleet, ready for immediate mobilization.

Being located in the port has always made the Hydrex headquarters ideally suited to mobilize our workboats to operations in Belgium, the Netherlands, the U.K. and France. Our boats as well as our vans and trucks are fully accommodated to serve as dive support stations and can mobilize at moment's notice to emergency operations. A wide range of additional state-of-the-art equipment and tools is available at all times in our fast response center and can be loaded onto the boats or vans immediately.

Recently the dock space available to us has been extended and closed off for traffic. This is the result of our excellent cooperation with the city and the Port of Antwerp. It has expanded the logistic possibilities even further.

The combination of our increased office size and advanced warehouses allows us to offer you the highest quality services. This is the real reason behind the expansion of our headquarters. We want to provide our customers with the fastest and most cost effective solutions, providing a long-lasting product.

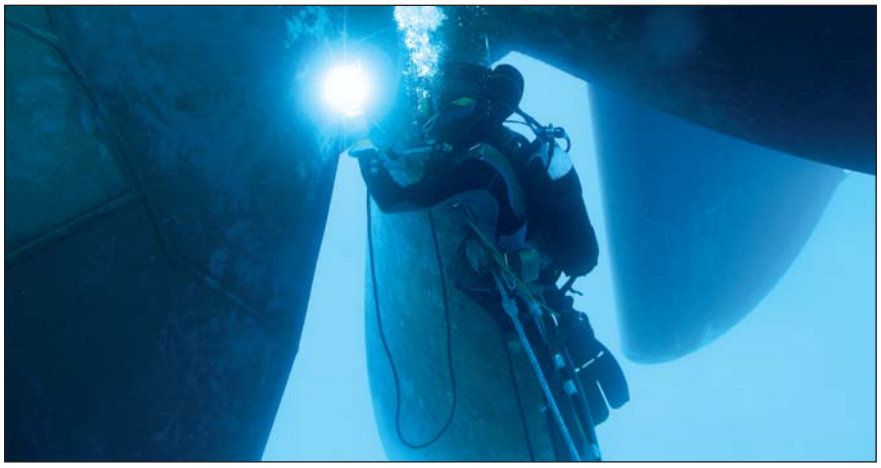
We invite you to call us 24/7 and get advice on any problem without cost or obligation. We always deliver what we promise. ■

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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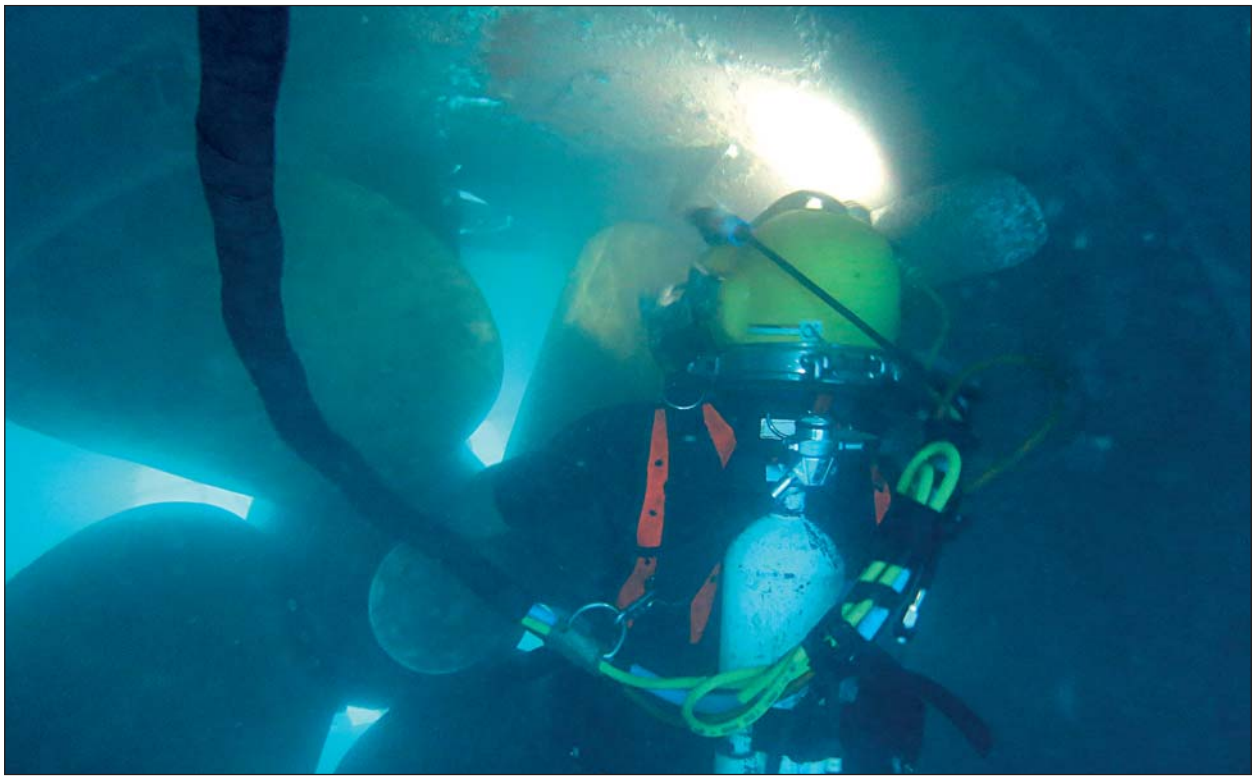
Swift on-site bow thruster operations



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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