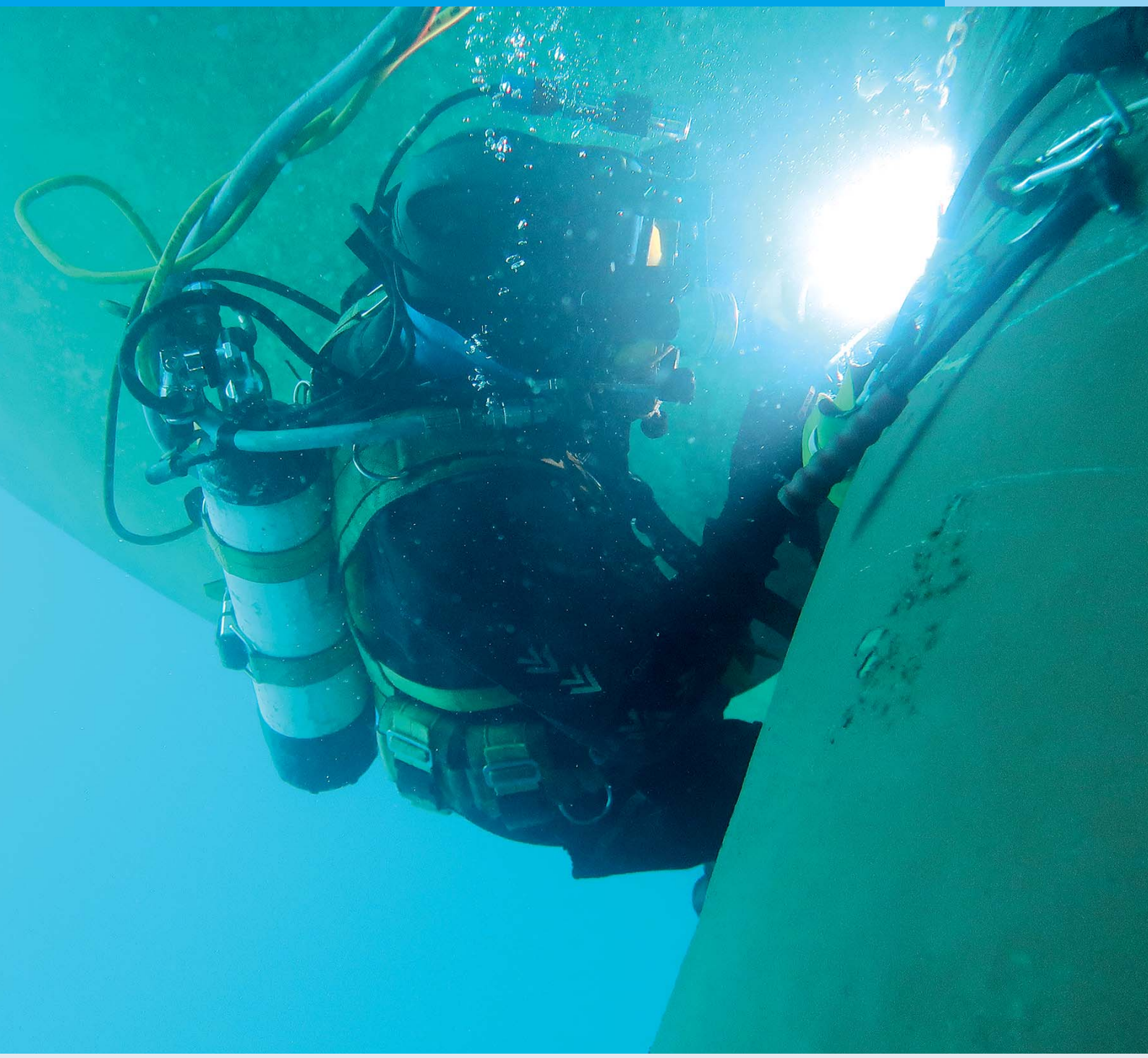
HYDREX®

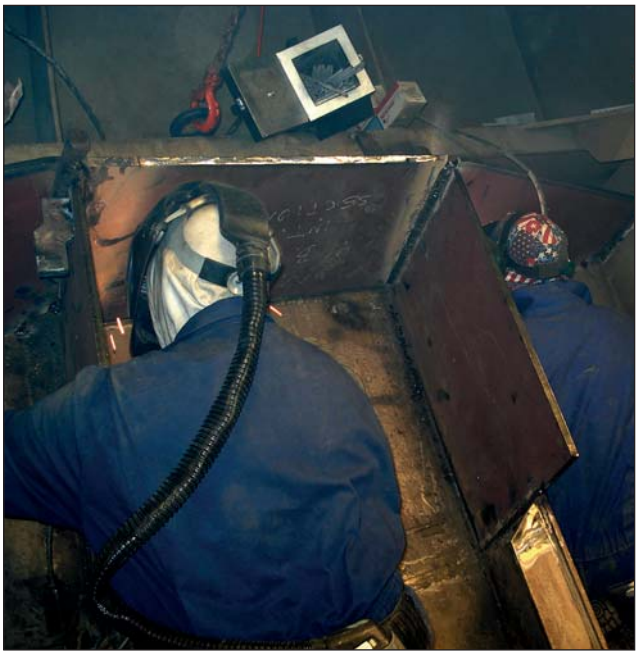
UNDERWATER TECHNOLOGY

Magazine

Number *267*



Underwater scrubber sea chest installation



Our wide range of maintenance and repair services includes the installation of additional sea chests required for the intakes and outlets of scrubber systems. These afloat installations are performed by installing a cofferdam on the hull.

We can help you when going to drydock is not an option, if the scrubber equipment is not available yet during docking or if the scrubber system needs to be installed before the next scheduled docking. We are able to carry out the installation of sea chests while your vessel stays afloat and in most cases during cargo operations.

If you would like to discuss this possibility of in-water scrubber system installation, please contact us at +32 3 213 53 00 or hydrex@hydrex.be

HYDREX®
UNDERWATER TECHNOLOGY

Phone: + 32 3 213 5300 (24/7)
Fax: + 32 3 213 5321
hydrex@hydrex.be

www.hydrex.be

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.

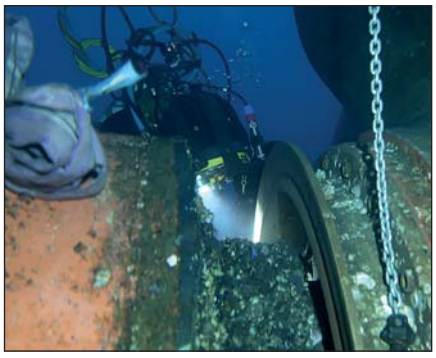
On our website (www.hydrex.be) you can find a more comprehensive overview of the services we offer to our customers. If you need more information on any these, do not hesitate to contact me. I am always available to answer your questions.

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

Table of contents



ISO 9001 certified

Underwater services and technology approved by:

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

HYDREX®
UNDERWATER TECHNOLOGY

Immediate worldwide mobilization for underwater seal repairs

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.

One of our divers preparing the seal assembly for installation of our flexible mobdock.

Damaged stern tube seals will cause an increasing amount of oil leaking or water ingress as the damage worsens. By replacing the seals when the damage is first discovered, we keep the down time low. The ship can keep its schedule as seal repairs can be performed during cargo operations. We do this by creating a dry underwater working environment around the shaft.

The flexbible mobdock is lightweight and can be mobilized to any location around the world.

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.

All shaft seal repairs we offer are performed in cooperation with the OEM. 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.

In this article you can find a short summary of a recent stern tube seal repair.

One of our divers inside the modock during a seal replacement.

Hydrex welder working on the rope guard.

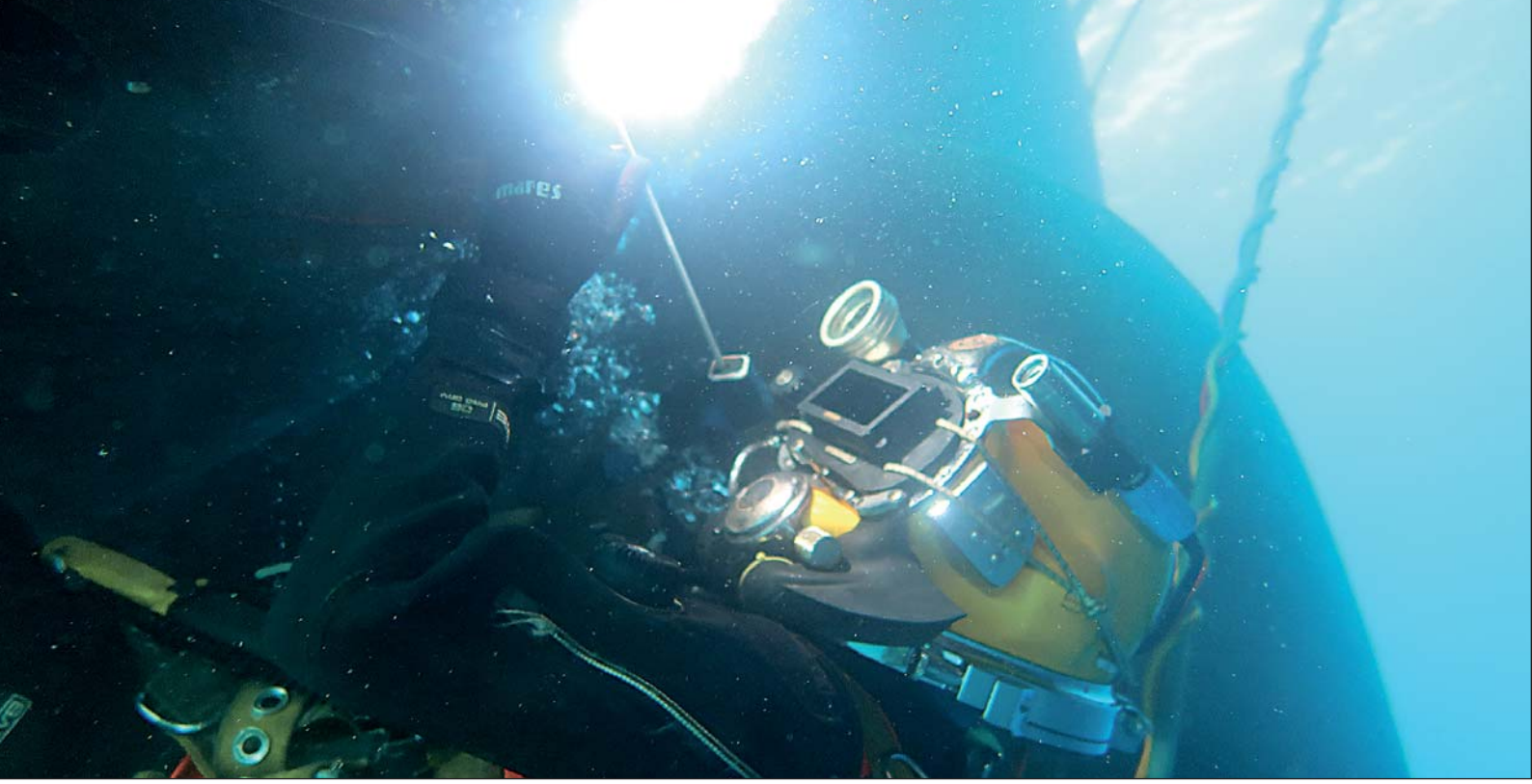
Hydrex US ready to mobilize immediately

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.

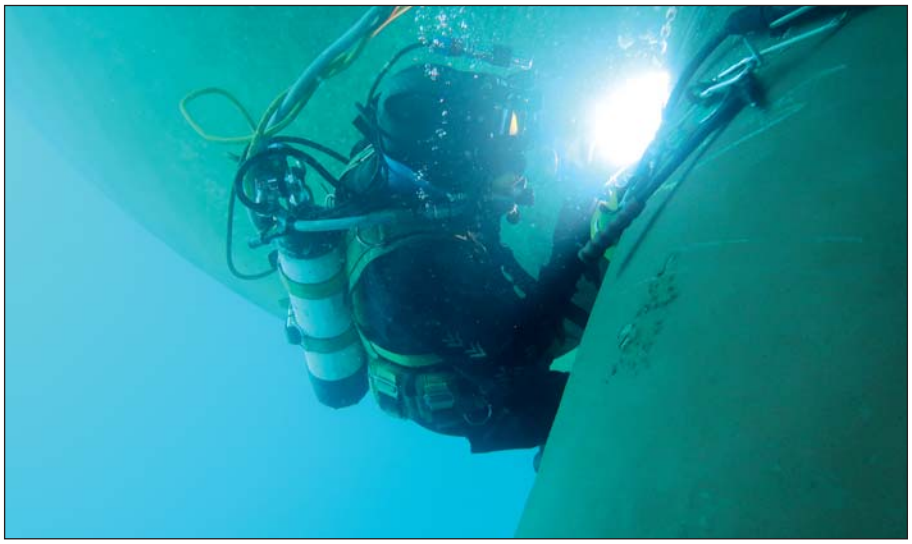
All staff members of the Hydrex office in Clearwater undergo stringent training at the Hydrex headquarters in Antwerp. They can carry out both simple and complex high quality jobs even in the harshest of circumstances.

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.

HYDREX®
UNDERWATER TECHNOLOGY



Reinstalling the rope guard after a stern tube seal operation.



All welding work is performed by certified welders.

One of our men removing the last equipment used for a seal operation.

No drydocking needed

One of our diver/technician team carried out underwater stern tube seal repairs on a 225-meter bulk carrier during the vessel's stop in Ghent. The ship's stern tube was suffering an oil leak, making a quick on-site repair necessary.

We have been using our flexible mobdock technology successfully for almost twenty years and our teams have carried out many underwater shaft seal replacements in that period. As a result our technical department was able to offer a repair plan to the customer very quickly.

Once the operation was approved all preparations were handled swiftly. Our diver/technicians mobilized to the ship with one of our workboats. These are fully equipped as dive support stations.

During the operation the team removed the damaged seals and replaced them with new ones. Working together with the OEM allowed us to provide our customer

Reinstalled rope guard.

One of our workboats was used during the operation in Ghent.

with original spare parts which guarantees the best quality material. A technician of the seal manufacturer was also present during the operation.

Taking advantage of the Hydrex flexible mobdock technique our men were able to carry out the entire repair on-site and underwater. Because all the required material is ready to be transported at all times, no time is lost making preparations. As a result the owner of the bulk carrier did not have to delay his ship's schedule unnecessary, let alone arrange a costly and unwelcome trip to drydock.

Conclusion

Our fast response centers are equipped with all the latest facilities, lightweight equipment and tools. This allows for a timely arrival of our teams on any location around the world with everything they need to successfully complete the job.

Contact us for more information on seal or other underwater repairs. We are at your disposal 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

Underwater propeller blade cropping in Singapore restores efficiency

Recently one of our diver/technician teams performed a successful propeller blade cropping operation on a 247-meter tanker while the vessel was in Singapore. Because of the severity of the damage, cropping was the only option.

One of the propeller blades of a tanker was severely bent.

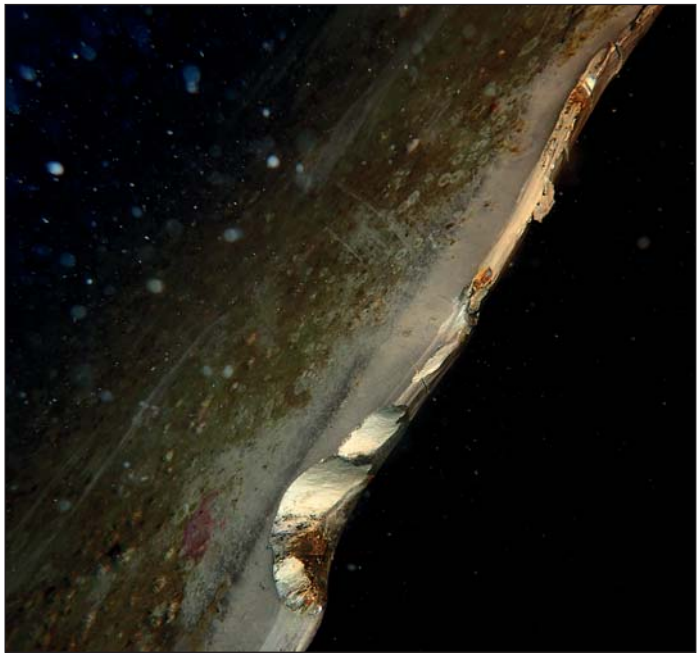
When the propeller blades of the tanker got damaged a fast on-site solution was needed to restore the propeller's balance with a minimal loss of efficiency. This would avoid an extended off-hire period to go to drydock.

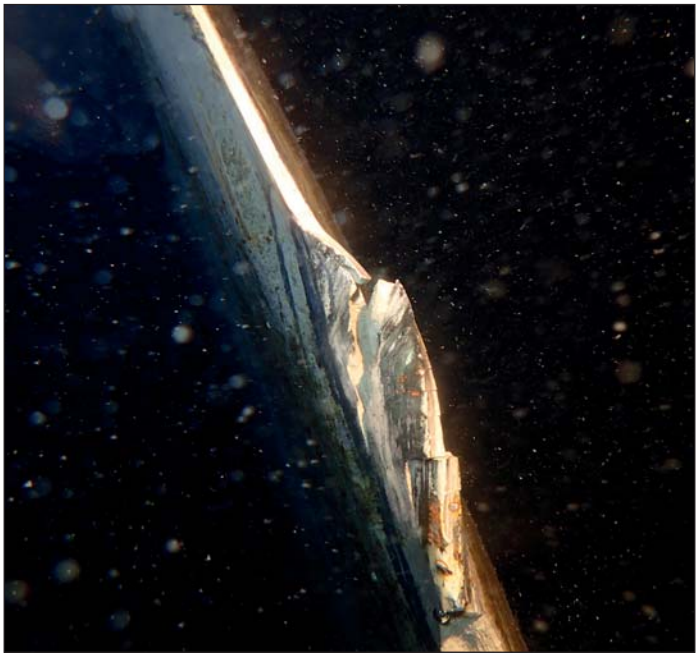
One of our teams was therefore rapidly mobilized to the ship's location in Singapore. Here they met up with our local support base. They assisted us during the operation.

The expertise and experience of our divers allowed them to easily divide the repair in parts so that the propeller modifications could be performed in the shortest possible time frame.

After the team arrived at the vessel's location they started the underwater operation with a detailed survey of the affected propeller blades. This underwater inspection revealed that one of the four blades was bent 90°. Cropping was unfortunately the only option.

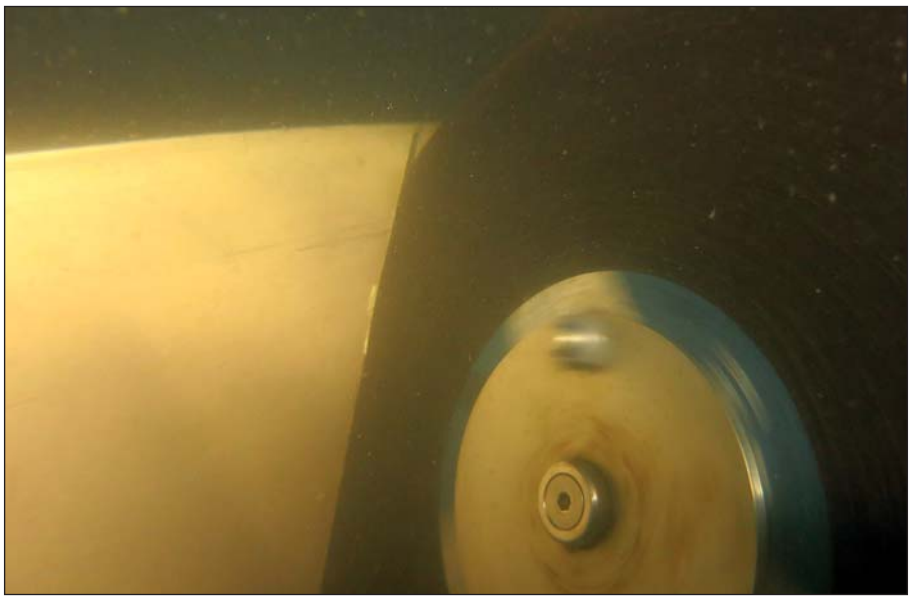
This kind of repair is carried out with the propeller blade cutting





Cracks and dents on trailing edge of one of the blades.

The expertise of our divers allows them to perform fast, high quality operations.



Cropping of propeller blades can be performed underwater.

Hydrex diver working on the trailing edge of a damaged propeller blade.

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.

HYDREX®
UNDERWATER TECHNOLOGY

equipment developed by our research department. The equipment is lightweight and can be mobilized together with the divers.

The team used the information acquired during the inspection to calculate and determine the ideal cutting line. They then cropped the damaged blade and ground the edges to give it the correct shape. The opposite blade had only been slightly damaged, but it was also cropped to keep the propeller's balance. This blade had suffered smaller cracks and dents along its trailing edge. Our divers therefore grinded out the cracks and polished the edge of the blade. This gave the propeller back its original efficiency and prevented further cracking.

When the cropping was complete our men polished the two cropped blades to make sure that any remaining loss of efficiency would be minimal. The other two blades needed no modifications.

When the cropping was complete our men polished the cropped areas of the blades.

The modifications achieved the greatest possible efficiency for the propeller.

During the operation a class surveyor was present. He gave his approval for the repair after a final inspection.

Conclusion

Damaged propeller blades will have a performance below average and cause vibrations. The engine will have a higher work load. This results in increased fuel consumption and added stress. If straightening is not an option, the affected area on the blade will be cropped. By doing this the greatest possible efficiency is achieved for the vessel. This type of repairs can be performed on-site and underwater, allowing a ship to continue commercial operations without the need to drydock. ■

The cropped pieces of the two opposite propeller blades.

The immeasurable value of underwater inspections

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 their ship's hull condition and consequently its performance, with only a minimum of work on their part.

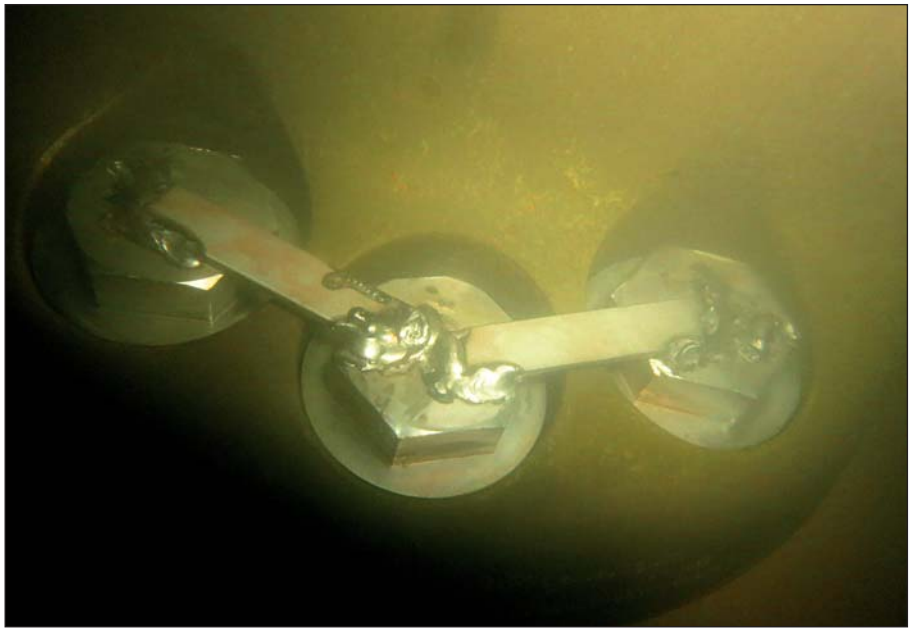
Hydrex diver/technician during the inspection of a stern tube seal assembly.

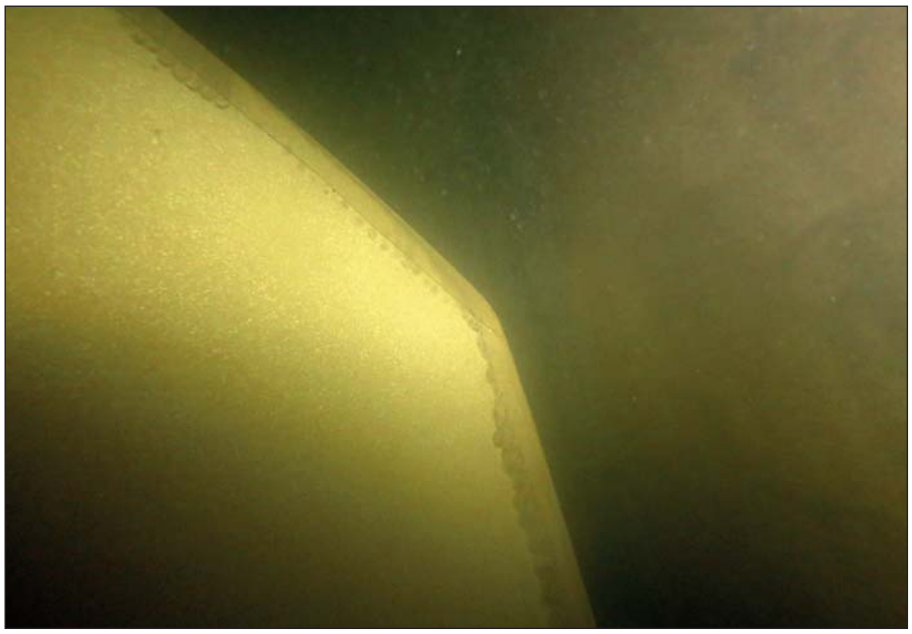
Underwater inspections represent a small investment and, if properly done, have the potential to save an owner a great deal of money.

Competent underwater inspections, particularly if carried out regularly can detect

- Problems with the propeller such as bent or damaged blades (which can put undue strain on bearings), roughness due to fouling, cavitation damage or bad polishing which can reduce the propeller's efficiency.
- Anodes which have wasted away, rendering the cathodic protection system unworkable, leading to corrosion and added hull friction.
- Hull cracks or other damage which, if not rapidly arrested, can worsen and increase the cost of any subsequent repair.
- Ropes inside the stern tube assembly which may cause seal problems if neglected.
- Leaking stern tube or thruster seals which can cause an environmental problem in port and lead to costly changes to a ship's schedule if not caught quickly and repaired.
- Clogged sea chest grids (preventing proper cooling of the ship's engines), or loose or damaged grids.
- Loose or broken grids on thruster tunnels which can result in damage to thruster propellers.
- Damaged, bent, broken or detached bilge keels which again can become much worse if not caught early.
- A damaged rudder which will continue to deteriorate if not addressed rapidly, resulting in the need for much more costly repairs and representing a safety hazard in extreme cases.

Hydrex team arriving next to a ferry in Calais for a bow thruster inspection with a very short window.





All three bow thrusters were inspected in the short time before the ferry had to sail again.

Hydrex divers are experienced in both maintenance and repair operations.

Regular inspections carried out by competent divers and followed by comprehensive and accurate reports can detect any of these or other problems so that they can be corrected early and prevent the more costly repair which neglect and further damage would incur.

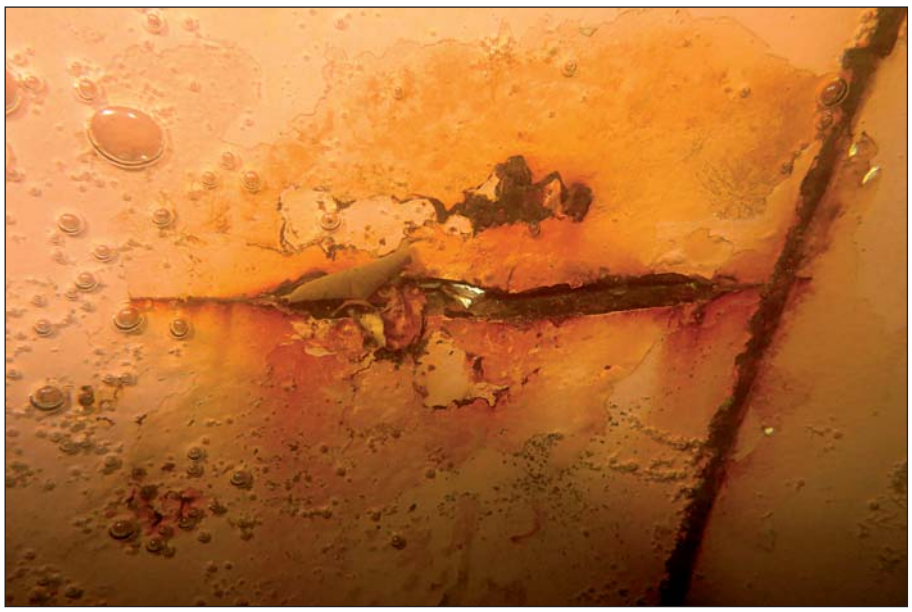
Because we have 45 years of experience in both maintenance and repair services, we can carry out any required follow up repair very fast without any unnecessary loss of time. Planning in a new slot is not needed as all our diver/technicans are skilled to perform the repair work as well.

If the damage found during an inspection can be anticipated, the required equipment can be mobilized in advance. Otherwise it can be transported to the location of the vessel immediately from one of our fast response centers where a large stock is available for our teams at all times.

This was demonstrated when a rope guard had come loose, which was revealed during an underwater inspection. The Hydrex team secured the rope guard without any delay for the owner.

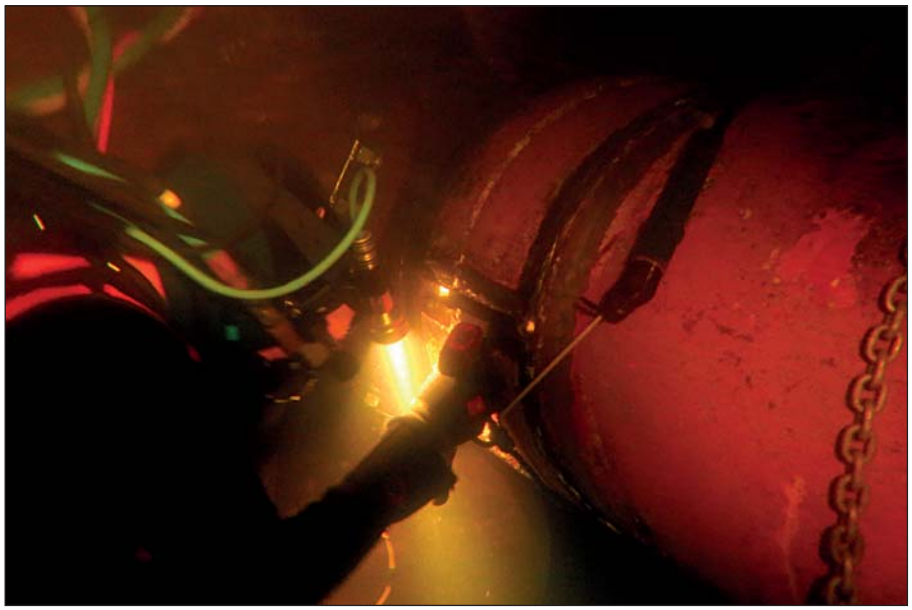
Inspections before drydocking

There is another important way for underwater inspections to be used to save costs. A thorough inspection carried out a week or two before a ship is due to go to drydock can save a great deal of money in drydock. An accurate estimate of work required can lead to efficient scheduling. If thrusters are to be repaired in drydock they can be removed prior to the ship's drydocking and can be repaired and ready for reinstallation when the ship is in dry-



If damage is found during an inspection, our team can perform the required follow up repair.

We can carry out repairs for the shipping as well as the offshore industry.



Hydrex diver working on the rope guard.

dock, rather than waiting until the docking to find out and then having to extend time in drydock in order to repair and replace the thruster.

An accurate report on the state of the rudder can lead to effective repair and recoating of the rudder so that it does not suffer further damage.

The all-too-frequent scenario of a low estimate for drydocking which grows exponentially once the dry-dock gate has closed and the ship is out of the water can thus be avoided.

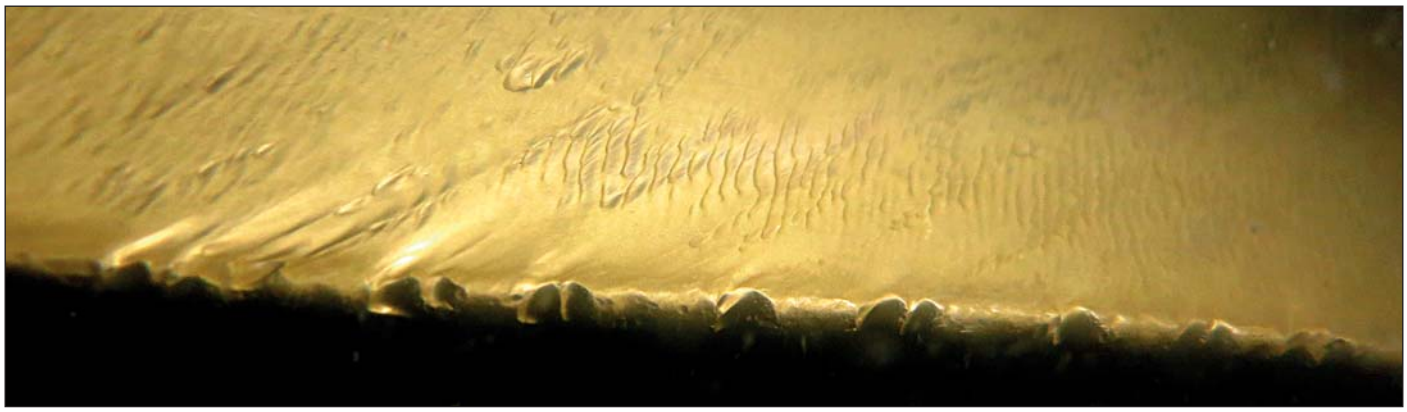
Easy to combine with other operations

Because an underwater inspection is a small operation, it can be combined with one or more other operations very easily. This can be another maintenance operation like a propeller buffing or any type of repair job.

By doing this, the shipowner is saved the hassle and cost of multiple mobilizations and possible delays to his vessel's sailing schedule.

Speed is of the essence

Hydrex diver/technicians can carry out inspections underwater and on-site very swiftly without disturbing the vessel's sailing schedule. A good example of this are the inspections of the bow thrusters carried out on two ferries in Calais. Because of the nature of these vessels, the time frame was extremely short. Both times all three bow thrusters needed to be inspected in the small window available. A change to the schedule was out of the question as it would do great harm to the reputation of the owner.



An inspection will give a shipowner a perfect assessment of any damage, so that he can take an informed decision on what to do.

Hydrex team leader monitoring an underwater operation.

We have always put great effort into minimizing the impact of our services to the schedule of a vessel. Our teams are trained to adapt themselves to the agenda of the ship and not the other way around. ■

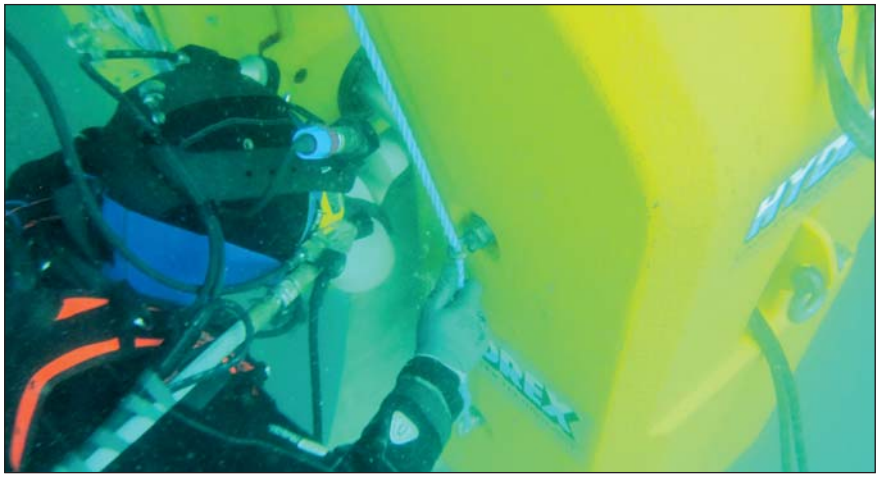
KEEPING SHIPS IN BUSINESS

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.



HYDREX®
UNDERWATER TECHNOLOGY

Phone: +32 3 213 5300 (24/7)
Fax: +32 3 213 5321
E-mail: hydrex@hydrex.be
www.hydrex.be

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

Phone: + 32 3 213 5300 (24/7)
Fax: + 32 3 213 5321
hydrex@hydrex.be

Always on time

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 performs 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 we 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.

HYDREX®
UNDERWATER TECHNOLOGY

Headquarters Hydrex N.V. - Antwerp
Phone: + 32 3 213 5300 (24/7)
E-mail: hydrex@hydrex.be

Hydrex Rotterdam
Phone: +31 10 313 25 19 (24/7)
E-mail: info@hydrex.nl

Hydrex Spain - Algeciras
Phone: + 34 956 675 049 (24/7)
E-mail: info@hydrex.es

Hydrex LLC - Tampa, U.S.A.
Phone: + 1 727 443 3900 (24/7)
E-mail: info@hydrex.us

www.hydrex.be