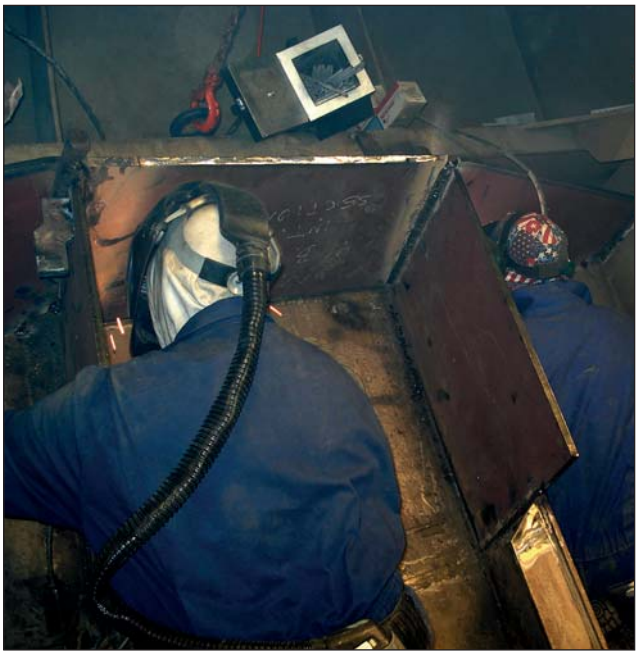
HYDREX®

UNDERWATER TECHNOLOGY

Magazine

Number *265*

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

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Editorial

In this magazine we will give you a summary of some of the operations our divers recently performed. These highlight the different ways we solve problems that might seem similar at first glance.

The first article covers two underwater propeller repairs. In both cases the ship's crew noticed that the engine was overloading due to a damaged propeller. The blades of a cruise ship could be straightened, but the damage to the blades of a vehicle carrier was too severe and cropping was the only solution. Both repairs were carried out with our in-house developed technology.

The two stern tube seal repairs we write about in the second article also needed a separate approach. The damaged seals of a container vessel were replaced using our flexible mobdock technique whereas those of a general cargo ship could be replaced above water while the vessel was trimmed.

Both stories showcase the diversity of services we offer to the shipping industry.

Do not hesitate to contact us if you need assistance with your ship. If speed is of the essence or if you require a routine underwater operation: finding solutions for specific problems is what we do.

Hydrex founder
Boud Van Rompay

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

ISO 9001 certified

Underwater services and technology approved by:

BUREAU VERITAS
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Table of contents

Propeller blade repairs in Antwerp and Tenerife

Last month a team of our diver/technicians traveled to Tenerife for an underwater propeller blade straightening on a 246-meter cruise ship. Almost simultaneously another team cropped the heavily bent blades of a 200-meter vehicle carrier in Antwerp. In both cases the best solution was offered to the customer to restore the propeller's efficiency as close to the original condition as possible.

One of our divers positioning our propeller blade straightening machine.

The crew of both ships had noticed that the engine was overloading. Damaged propeller blades will have a performance below average. The engine will have a higher work load. This results in increased fuel consumption and added stress.

By taking advantage of the in-house developed cold straightening technique, damaged blades can be straightened underwater. This allows a ship with a damaged propeller to return to commercial operations without the need to drydock. Optimum efficiency of the propellers can be restored by bringing the blades back to their original form. This was done by one of our teams on the cruise ship in Tenerife.

Smoothing the creases

The four starboard side propeller blades of the 246-meter vessel were bent. A fast, on-site solution to restore the propeller's balance and efficiency was needed. After the equipment arrived at the vessel's

Severely bent propeller blades on cruise ship in Tenerife.

Hydrex diver getting ready for underwater propeller operation.

location the team started the operation with a detailed survey of the ship's two propellers. This revealed that the port side propeller blades were in good condition and did not require any repairs.

With the survey completed, the team positioned the straightening machine over the bend in the trailing edge of the first damaged blade. In close communication with the team leader in the monitoring station onshore, the divers returned the bent blade to its original state. When the straightening was complete, our technicians cleaned the blade to make sure that any remaining loss of efficiency would be minimal. The same procedure was then repeated on the other three blades.

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

We have developed our propeller cold straightening machine in-house.

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.

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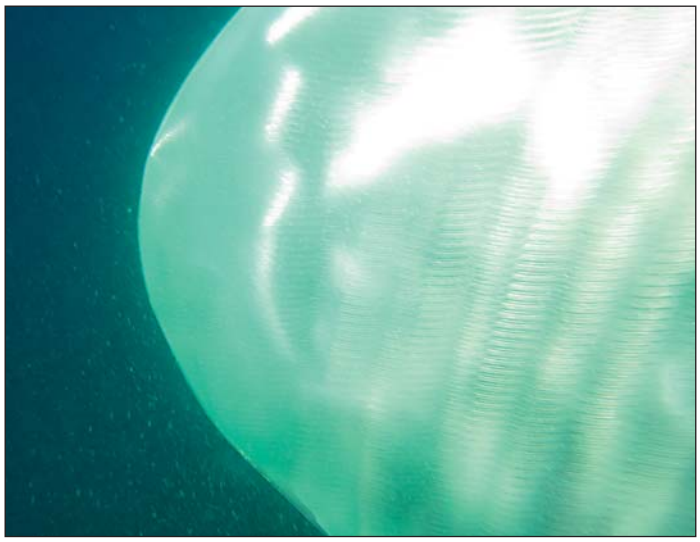
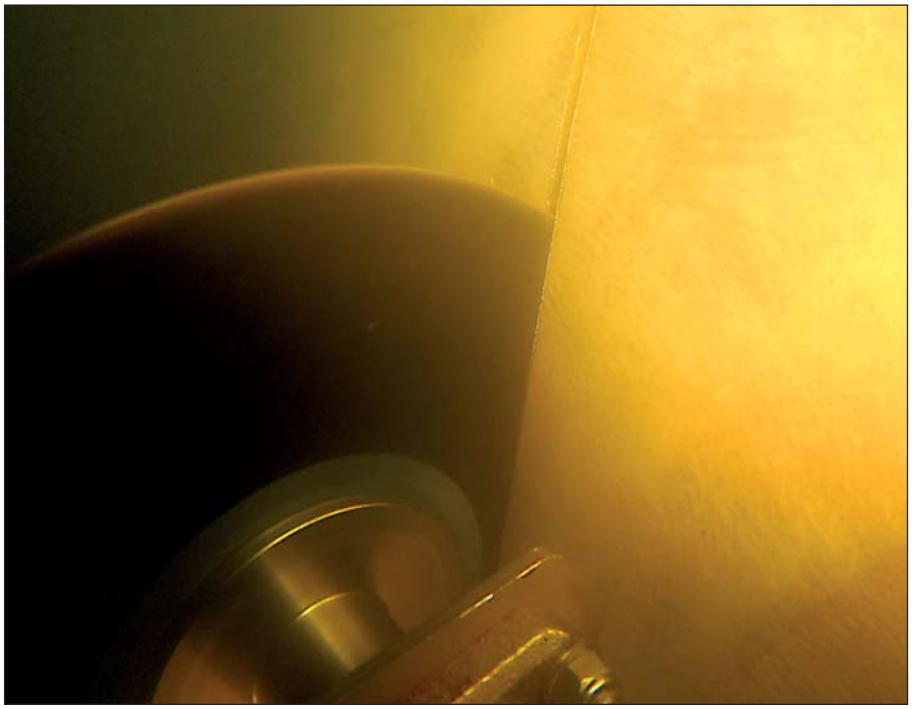



Propeller blades after straightening.


The blades of the vehicle carrier were too severely damaged to be straightened.



Cropping one of the damaged propeller blades in Antwerp.

the vessel. This was the case for the vehicle carrier in Antwerp.

The cream of the crop

With all four blades of the ship's propeller severely damaged, the engine was overloading. We were asked to restore the propeller's balance.

After the equipment arrived at the vessel's location the team started the underwater operation with a detailed survey of the affected propeller blades. Our team then used the information acquired during the inspection to calculate and determine the correct measurements

One of the cropped pieces of blade.

Cropped propeller blades of vehicle carrier.

needed to crop the propeller blades.

Next the divers cropped the blades. When the cropping was complete, the blades were cleaned.

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

Conclusion

Our R&D department is constantly looking into ways to enhance the available propeller repair techniques even further to improve our services. New models of both the straightening and the cutting machines have recently been put into service. These allow us to straighten blades that could previously only be cropped and to crop extremely damaged blades with only a minimal loss of efficiency for the propeller. Both types of repairs can be carried out on-site and underwater, allowing the ship to return to commercial operations without the need to drydock. ■

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
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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

Stern tube seal repairs above and below the waterline

Recently our men carried out six stern tube seal operations all across Europe in a very short time span. In this article we will be writing about two of those. In Flushing the four damaged seals of a 268-meter container vessel were replaced underwater with our flexible mobdock technique. In Antwerp a seal operation was performed on a trimmed 185-meter general cargo ship. Both repairs were carried out in cooperation with the OEM.

Our dedicated workboats are fully equipped as dive support vessels.

Repair in stages to fit the ship's schedule

Because the container vessel had a very tight schedule, we proposed to carry out preparatory work during an earlier stop in Dunkirk. This included the removal of the rope guard.

As a result our divers could immediately start the operation when the ship arrived in Flushing. They installed the flexible mobdock to allow for work in dry conditions.

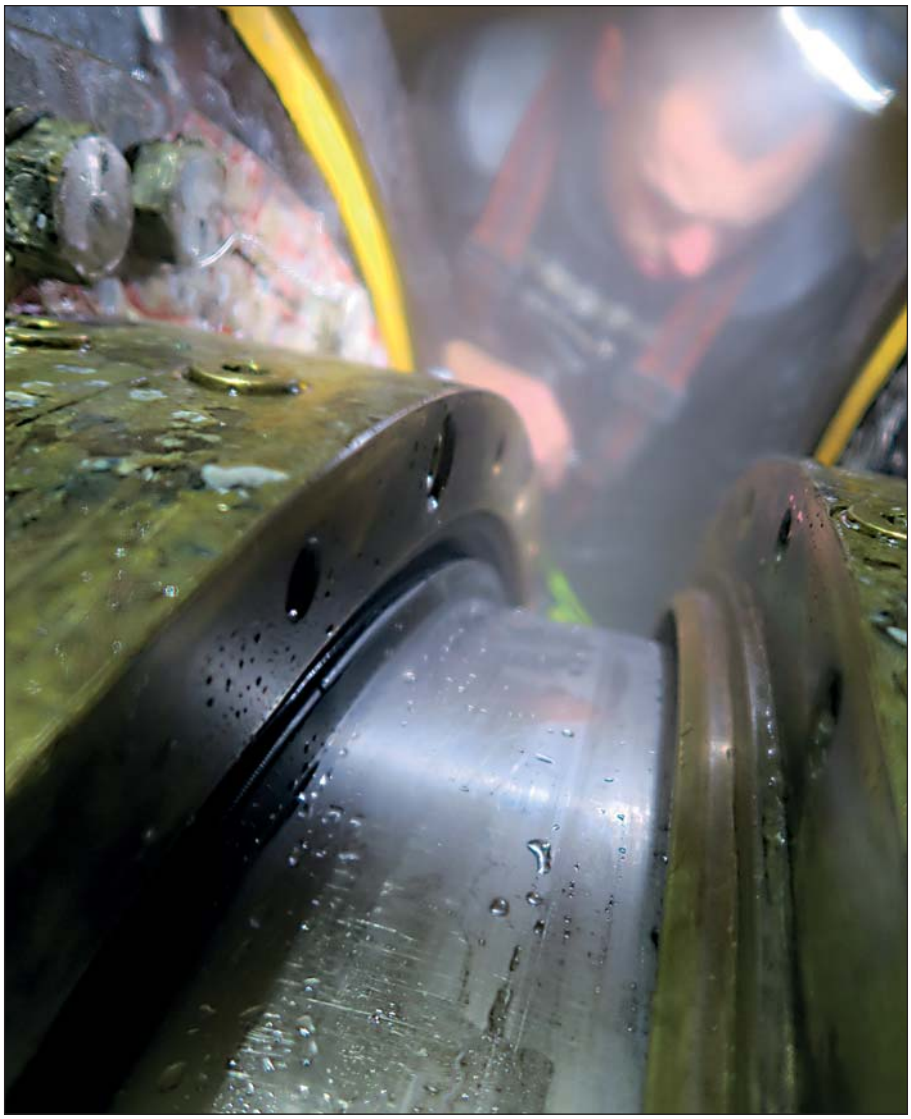

Emptying the water from one of our flexible mobdocks.

During the operation our divers removed the four damaged seals and replaced them with new ones. Working together with the OEM allowed us to provide our customer 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 our flexible mobdock technique the team was 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 was lost making preparations.

The ship then sailed to her next destination without delay to the schedule. During her stop in Le Havre our team reinstalled the rope

One of our divers taking the plunge.



Inside our flexible mobdocks divers can work in drydocklike conditions.

guard and finalized the repair.

By organizing all steps of this operation from start to finish the owner did not have to worry about making any arrangements for the repair.

Mobilization to this operation was done using one of our workboats loaded with all the needed materials. These boats are fully equipped as dive support stations and can be used for a wide range of operations. They increase flexibility of operation, which is essential during operations like these where speed is of the utmost importance.

Adapting operations to the customer's needs

The general cargo ship also suffered a leaking stern tube assembly. The owner contacted us and asked us to find the best possible afloat repair solution. Because the vessel could be trimmed we suggested to replace the damaged seals above water during the ship's stop in Ghent. The repair would be done in close cooperation with the OEM.

Prior to the operation the vessel was trimmed to lift the working area above the water. Our team then built a scaffolding around the stern tube seal assembly. Next our technicians removed the rope guard. This allowed them to clean the entire area and perform an inspection. The assembly was then opened to give the service engineer of the OEM access to the seals.

After the seals had been replaced the assembly was closed again. Leakage tests were then successfully carried out. Our men repositioned and secured the rope guard. They removed the scaffolding to conclude the operation.

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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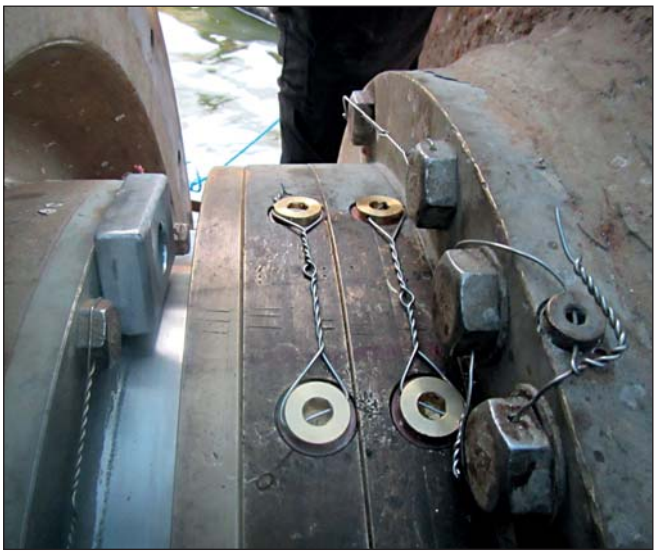
Seal assembly on cargo vessel in Ghent prior to seal replacement.

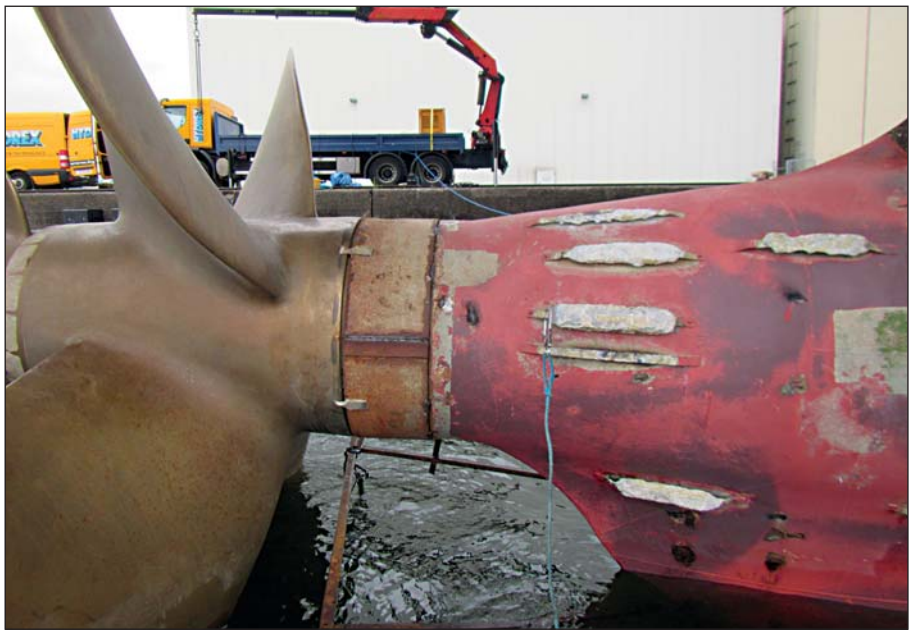
Hydrex trucks during operation in Ghent.

Replacement of one of the damaged seals.



Closed stern tube seal assembly after the repair.

Hydrex technicians reinstalling the rope guard.



Reinstalled rope guard on general cargo vessel.

Conclusion

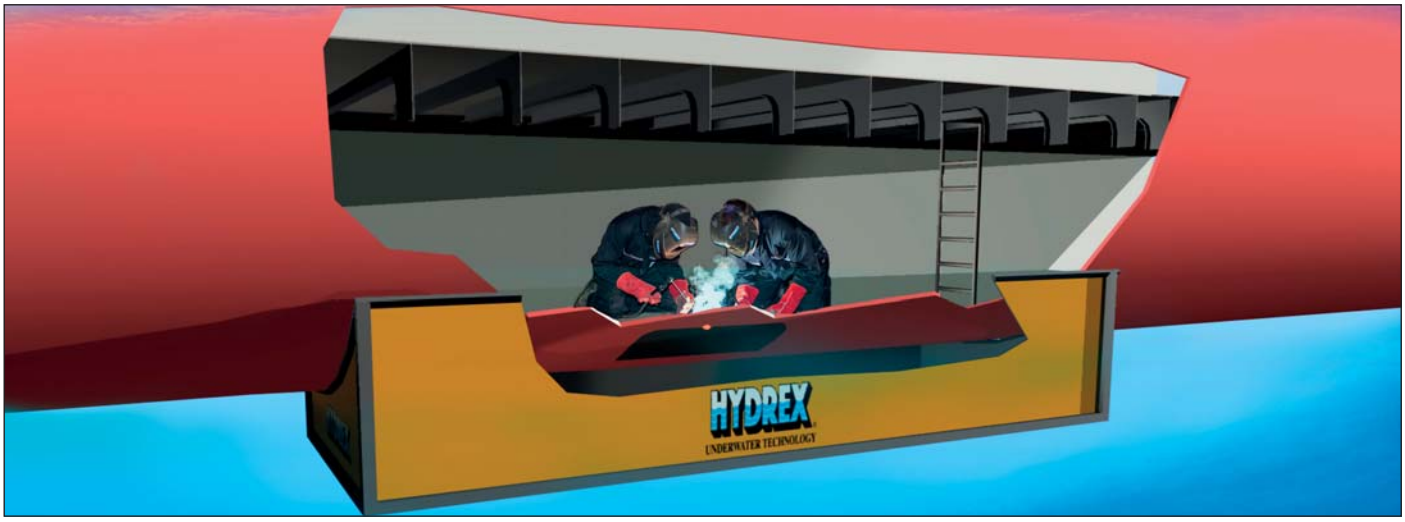
Both these operations are good examples of how we use our experience and know-how to offer the best solution for a specific situation. In the first example an underwater seal replacement using our flexible mobdock technique was the only option, but for the second vessel trimming was more efficient.

We aim to reduce cost and off-hire time for customers while maintaining the highest safety and quality standards of repair and maintenance. This is true whether the scope of work entails a smaller operation with a limited time-frame, or more complex repairs that usually take a lot more planning and require the construction of specific equipment.

If you have a problem, any problem, with a vessel give us a call. We will evaluate the situation and let you know if an in water solution is feasible. ■

KEEPING SHIPS IN BUSINESS

Hydrex permanent hull repairs out of drydock



Hydrex carries out permanent hull repairs without interruption of operations, approved by all major classification societies.

Hydrex developed and delivers *permanent* hull repairs on vessels afloat, fully approved by all the major classification societies. No need to go to drydock. No need to redo later in drydock. Gets your ship back in business fast, saving time and money.

How is it done?

1. We start off with an inspection to determine extent of defect.
2. Made-to-measure cofferdam secured on outside of hull to keep water out and create a dry environment during repair.
3. Crack removal/defective plating cropped.
4. Insert fitted.
5. Insert tacked in place.
6. Class approved full penetration welding from inside the ship and frame renewed as needed.
7. Independent ultrasonic testing to verify the welding.
8. The cofferdam is then removed.

Each step is checked by class before proceeding.

Cofferdam placed over crack.

Removing the damaged area.

Preparing the edge of the opening for the new insert.

Insert cut and fitted.

Insert tacked in place.

Full penetration weld.

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.

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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.

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