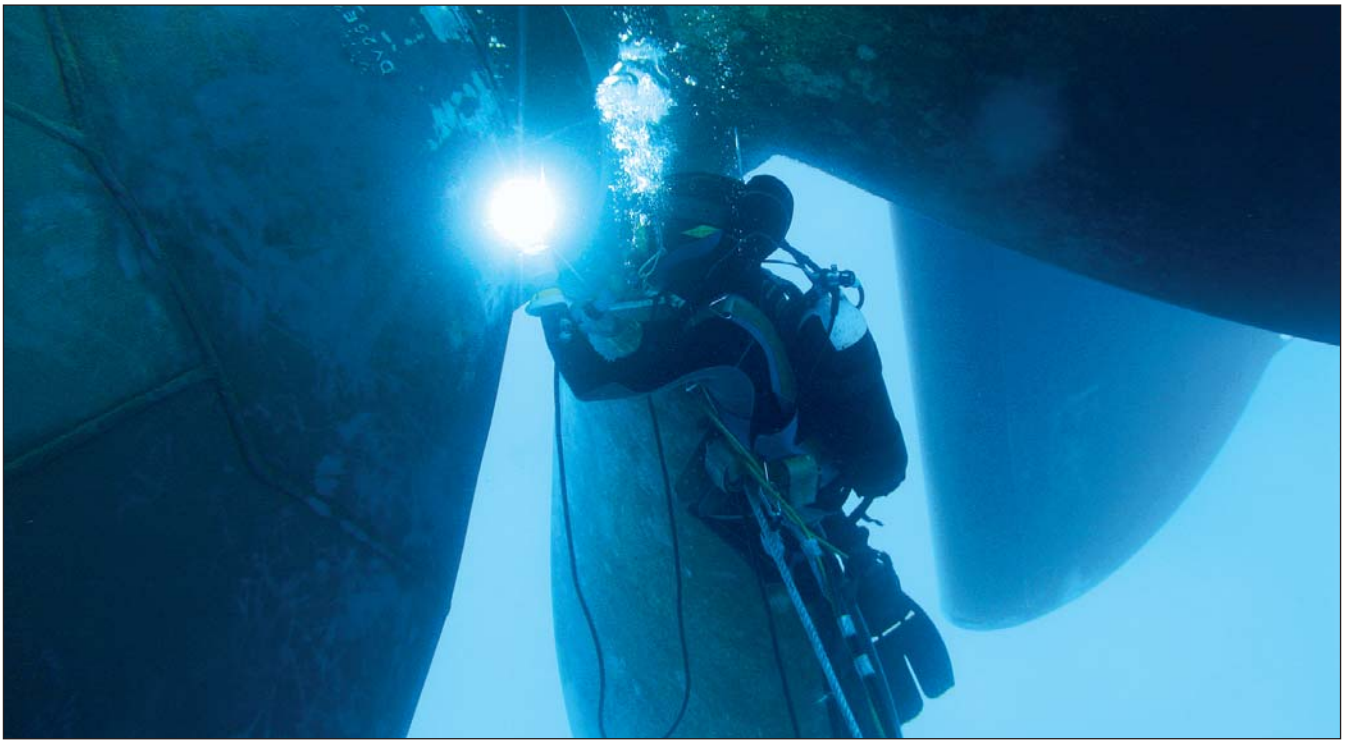
# HYDREX®

## UNDERWATER TECHNOLOGY

Magazine

Number *223*

# 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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## www.hydrex.us

# Editorial

**In a very short time span our diver/technicians carried out complex operations in U.S.A., Australia and Singapore. These repairs were performed back to back and showcase perfectly how Hydrex can deliver high quality and speed of services around the world thanks to over 40 years of experience.**

The job in America was carried out in Mobile, Alabama, where a 162-meter pipe laying vessel was suffering an oil leak. The owner contacted us to see if we could come up with an underwater solution that would allow the OEM specialists to access the thruster tunnel while the vessel was still afloat to work on the bow thruster unit. In the first article in this magazine you can find out how we helped him out.

A second article deals with two propeller cropping operations in Algeciras. They were carried out close to our Spanish office. One operation was carried out on a 174-meter LPG tanker, the second one on a 230-meter bulk carrier.

These operations were all performed with the same purpose in mind: to keep your vessel out of drydock.

Hydrex founder
Boud Van Rompay

*Cover: Open top cofferdam used during bow thruster operation in Mobile.*

HYDREX N.V.
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**Underwater services and technology approved by:**

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LLOYD'S REGISTER LRQA VCA*
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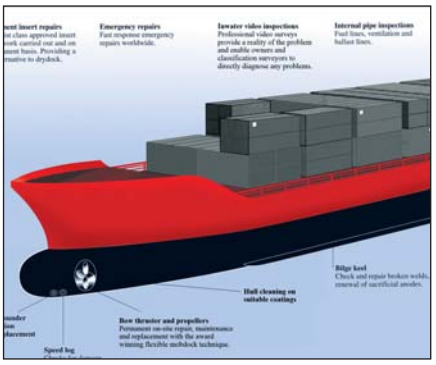
# Table of contents







# Hydrex enables OEM to access bow thruster out of drydock

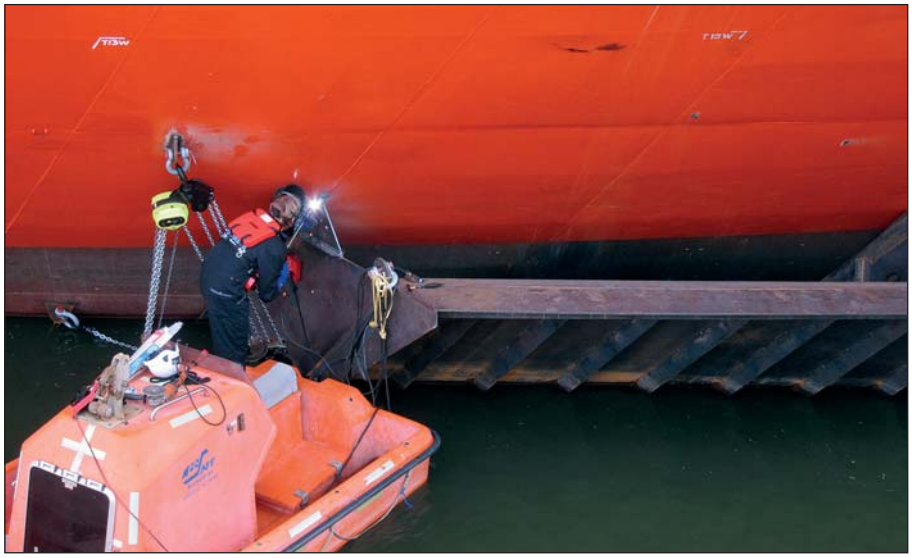
**When a 162-meter pipe laying vessel suffered an oil leak, going to drydock for bow thruster repairs seemed the only option. The owner contacted us to see if we could develop an underwater solution that would allow the OEM specialists to access the thruster tunnel while the vessel was still afloat. This would enable the vessel to stay on project.**

One of our technicians met up in Mobile, Alabama, with the owner and representatives of the OEM to discuss the repair plan devised by the Hydrex technical department. This proposal included the installation of two open top cofferdams to close off the thruster tunnel. The OEM specialists could then freely gain access to the bow thruster to examine the unit and make the necessary repair. The solution was accepted. Immediately we started making preparations for the design of the cofferdam and a fast mobilization to the vessel.

*Final touches being made to the cofferdams.*

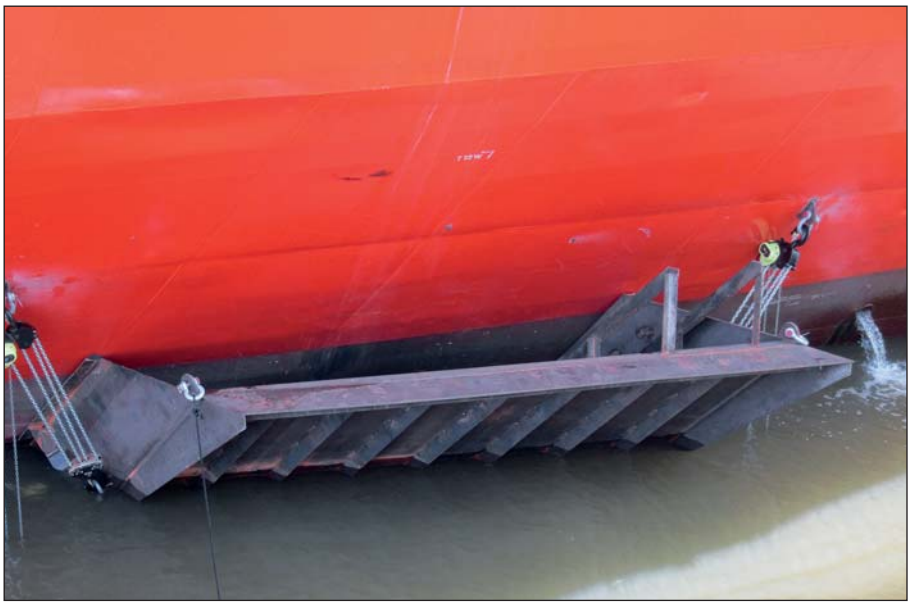
## Underwater thruster operation in Mobile, U.S.A.

Both cofferdams were designed by our in-house R&D department to fit the rounded shape of the ship's hull. They were built in Mobile at a local workshop. The construction started almost immediately after the operation was approved and the design was finished to make sure the cofferdams would be ready as soon as the vessel would arrive in Mobile.

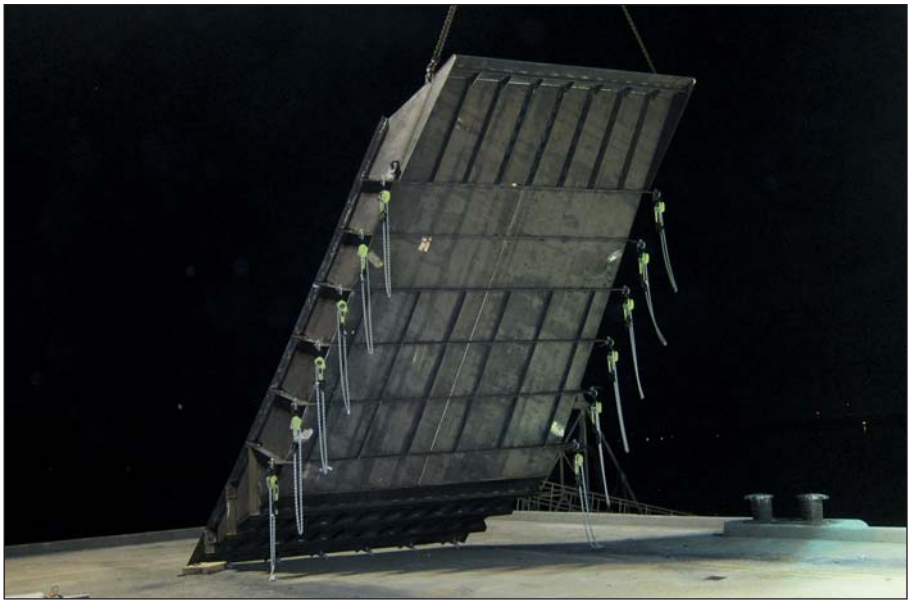


*Hydrex diver/technician securing one of the cofferdams.*

Because underwater visibility in the Port of Mobile is far from ideal, the



*Open top cofferdam with all water emptied from it.*



*One of the cofferdams prior to being lowered into the water.*

*Hydrex diver getting ready for underwater operation.*

# 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 much time and money.**

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 for a wide range of actions.

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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*Removing the propeller from the thruster unit.*

*Pulling the liner out of the bow thruster unit.*

rigging points for the cofferdams were welded to the hull by our divers while the vessel was at anchorage just outside the port, where the visibility was better. The ship then sailed to its lay-by position and the actual operation started.

The cofferdams were positioned and secured with the rigging points. All water was then removed from the thruster tunnel. This created a dry environment inside the tunnel. The required inspection and repair work could now be performed in conditions similar to those in drydock. Next our technicians removed the tunnel grid to gain access to the bow thruster unit. The oil was then drained from the thruster.

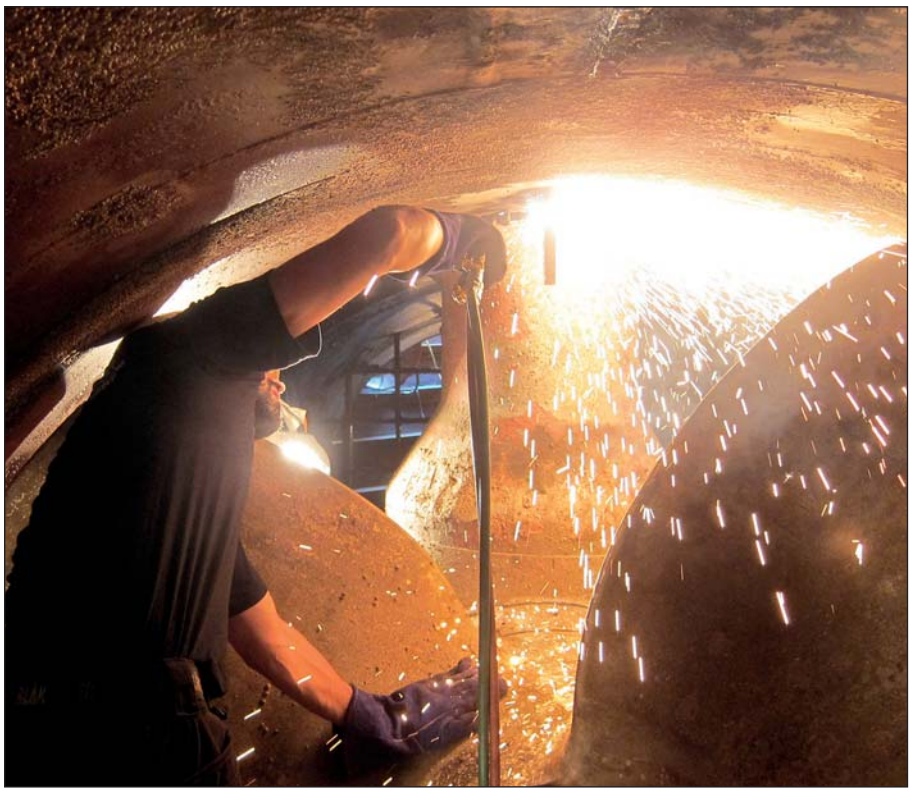
The OEM specialists entered the tunnel and examined the bow thruster unit. They decided that the seals needed to be replaced. This specific type of seal assembly required the liner to be pulled out of the assembly in its entirety to work on the seals. To do this, the propeller first needed to be removed. Our technicians therefore installed two anchor points in the tunnel to secure the propeller during its removal.

The liner was pulled out of the unit in one piece with the rope guard and the three seals. The rope guard and the seals were then removed from the liner and the seals were replaced. Next the liner and rope guard were repositioned in the assembly and the propeller was reinstalled. Pressure and leakage test confirmed that the replacement was successful.

Our technicians then removed all the equipment from the tunnel and repositioned the grid. All that remained to be done was re-flood the bow thruster tunnel and detach the cofferdam.

*The rope guard and the seals are one unit and cannot be removed separately from the liner.*

*Liner pushed back into the assembly after reinstallation of the rope guard and the new seals.*



*Hydrex technician working on the rigging points in the thruster tunnel.*

# 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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*Installing the propeller on the assembly.*

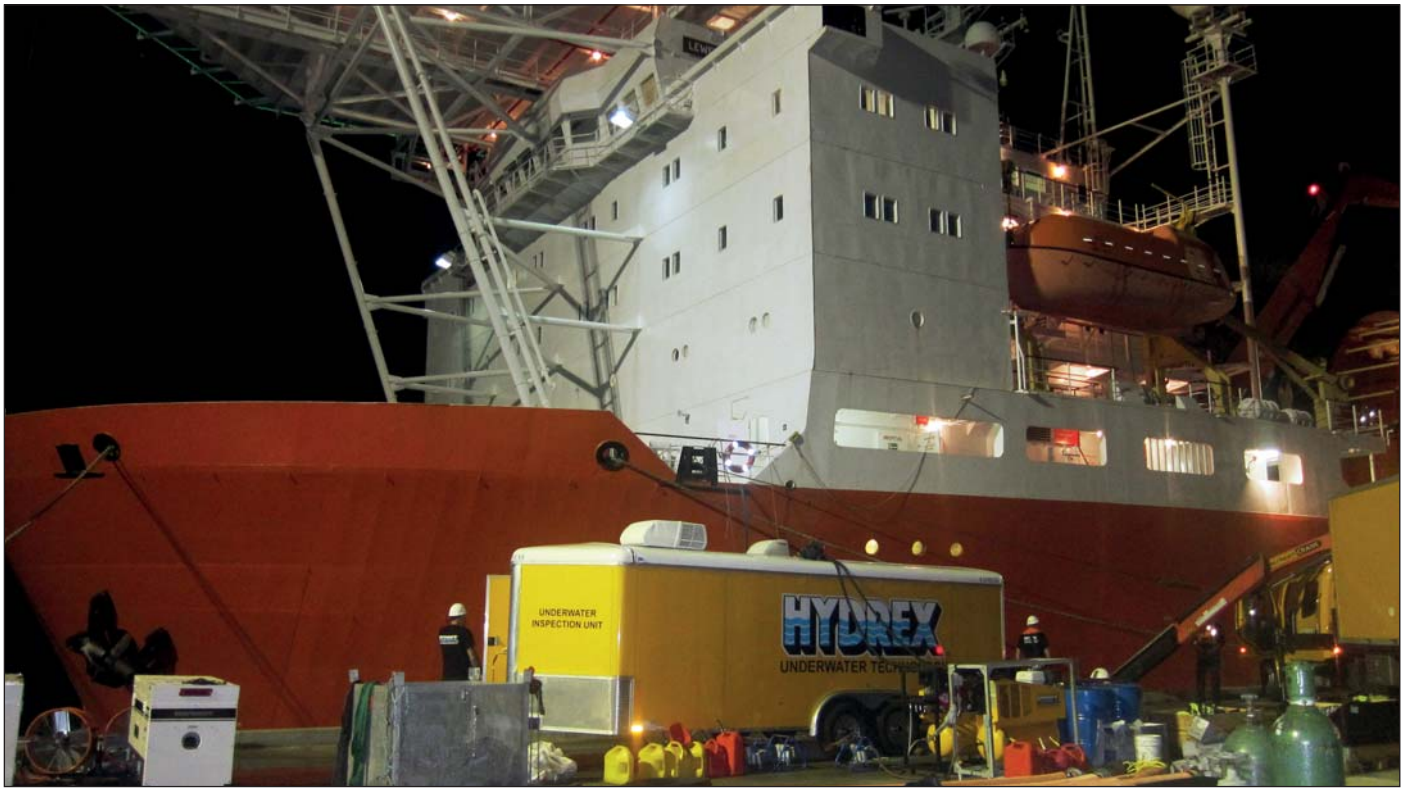
*Bow thruster tunnel ready to be flooded again after the repair.*

## Conclusion

The operation required Hydrex to think and handle fast to allow the owner to keep his ship on project. The schedule of the pipe laying vessel offered only a window of two weeks to develop an underwater solution and two further weeks to carry out the operation, including the building of both cofferdams. The plan needed to give the OEM specialists the possibility to perform inspections and repairs of the bow thruster in the same conditions they would have in drydock.

On top of this repair in the U.S.A., our technical department was arranging operations in Australia and Singapore (as well as many smaller operations closer to home). These three bigger jobs were carried out back to back.

The limited time frame available in Mobile, combined with the extra requirements of the job, is something we know how to deal with. We have fast response centers at our offices that have been designed for a swift mobilization to anywhere in the world. We also have over 40 years of experience with handling these kind of situations, which allowed us to come up with the best possible solution that would keep the vessel afloat while at the same time delivering the same high quality and speed of service during the other operations that were going on. ■




*Hydrex monitoring station next to the pipe laying vessel in Mobile.*

# 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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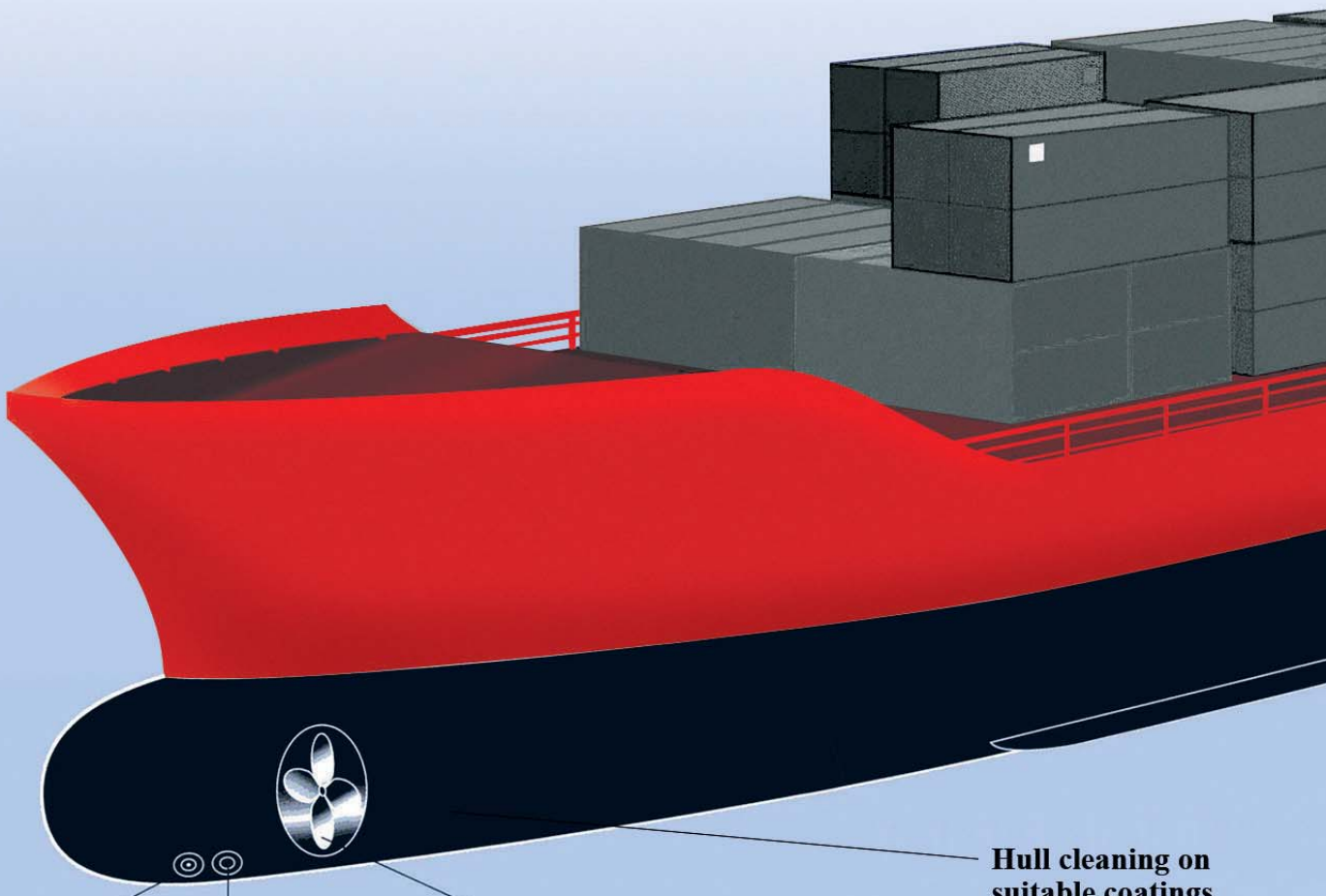
# High quality in-water ship rep

**Permanent insert repairs**
Specialist class approved insert repair work carried out and 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.



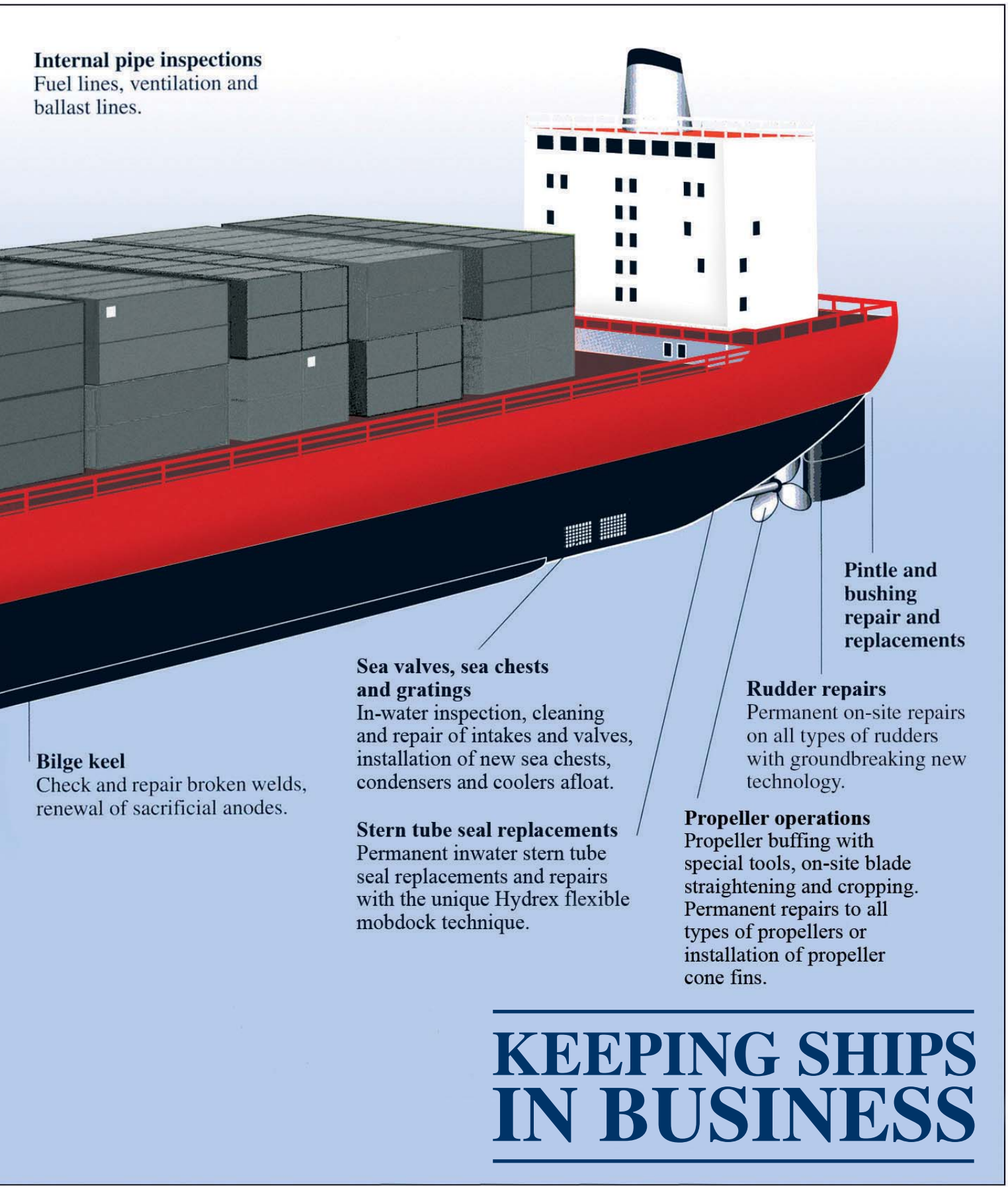
**Hull cleaning on suitable coatings**

**Echo sounder inspection and replacement**

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

**Speed log**
Checks for damage and marine fouling.

# air and fuel saving services

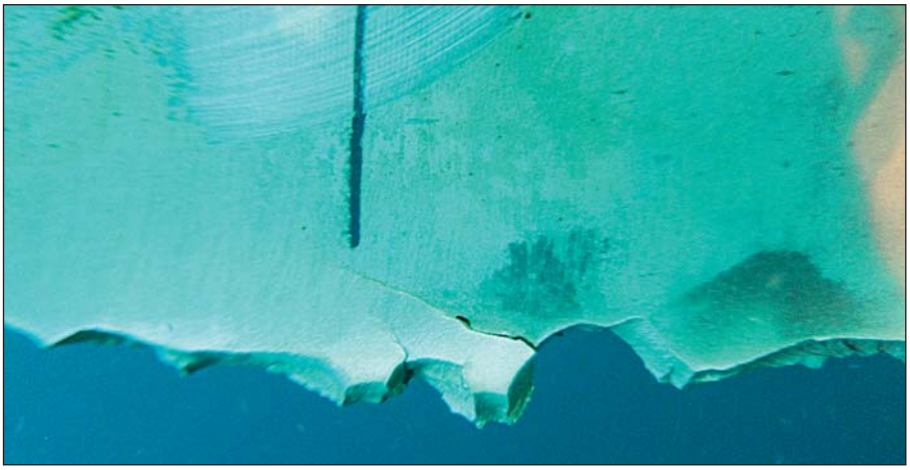



**KEEPING SHIPS IN BUSINESS**

# Underwater propeller modifications in Spain

**Recently Hydrex diver/technicians performed propeller croppings on two vessels berthed in Algeciras, close to the Spanish Hydrex office. The first operation was carried out on a 174-meter LPG tanker, the second one on a 230-meter bulk carrier.**

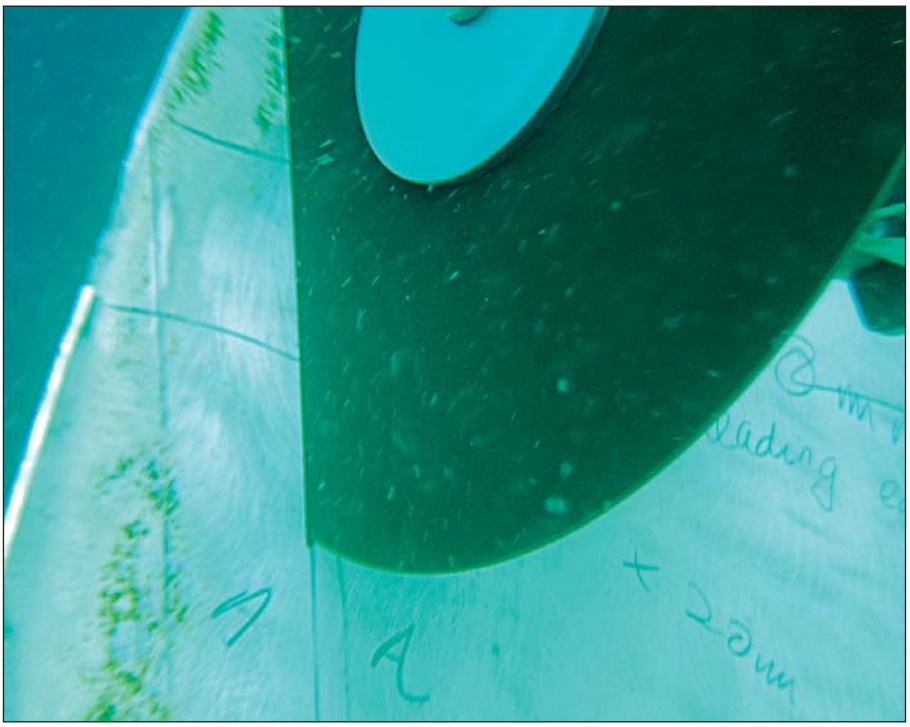
Both ships had suffered torn off pieces, severe cracks and bents on all four propeller blades. An on-site repair solution was needed to restore the propeller's balance with minimal loss of efficiency. Cropping the blades was unfortunately the only option. A team was therefore rapidly mobilized from the Hydrex office in Algeciras in both cases to restore the damaged blades to as close to their original condition as possible and rebalance the propeller.



*Damaged propeller blade edges of LPG tanker.*

*The blades were cropped using Hydrex in-house developed equipment.*


*Hydrex van during operation in Algeciras.*

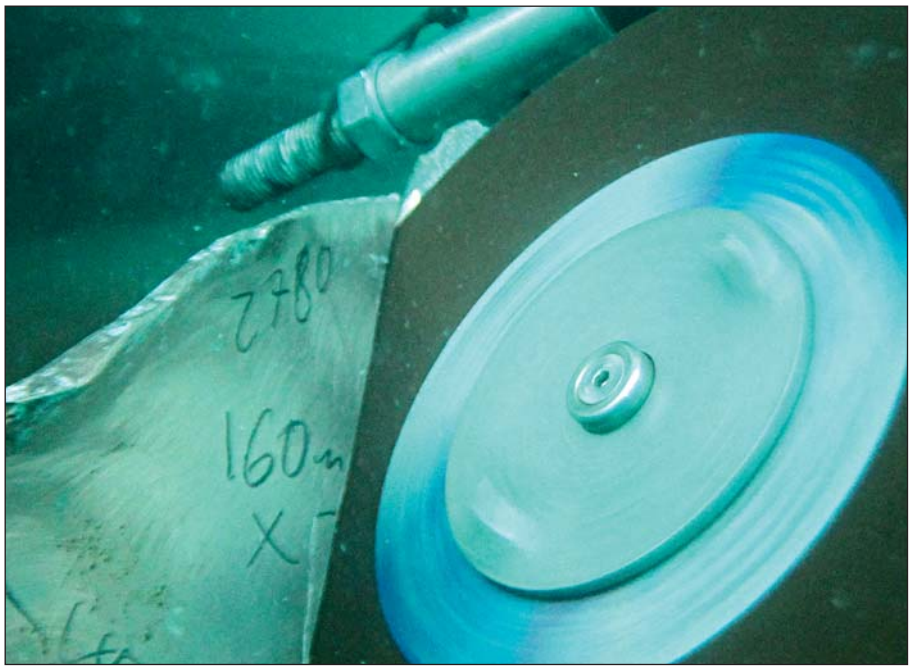


*Cropping one of the blades of LPG Tanker in Algeciras.*

*Cropped piece of one of the blades.*


*Severely cracked and bent blades of bulk carrier.*


*Hydrex diver getting ready for underwater operation.*



*The blades of the bulk carrier were cropped to restore the propeller's efficiency and balance.*


*The ideal cutting line was calculated for each of the blades.*


*After being cropped the edges of the blades were polished.*

The same procedure was followed on the LPG tanker as well as the bulk carrier. After the equipment arrived at the vessel's location the team started the underwater operation with a detailed inspection of the propeller. They then used the information acquired during the inspection to calculate and determine the correct measurements needed to crop the propeller blades. Once the proposal was approved by the class, the divers cropped the blades. When the cropping was complete, the blades were polished to make sure that any remaining loss of efficiency would be minimal.

## In-house research

Our R&D department is constantly looking into ways to enhance the available propeller repair techniques even further to improve our services. This allow us to crop damaged blades with only a minimal loss of efficiency for the propeller. This type of repairs can be carried out above or underwater 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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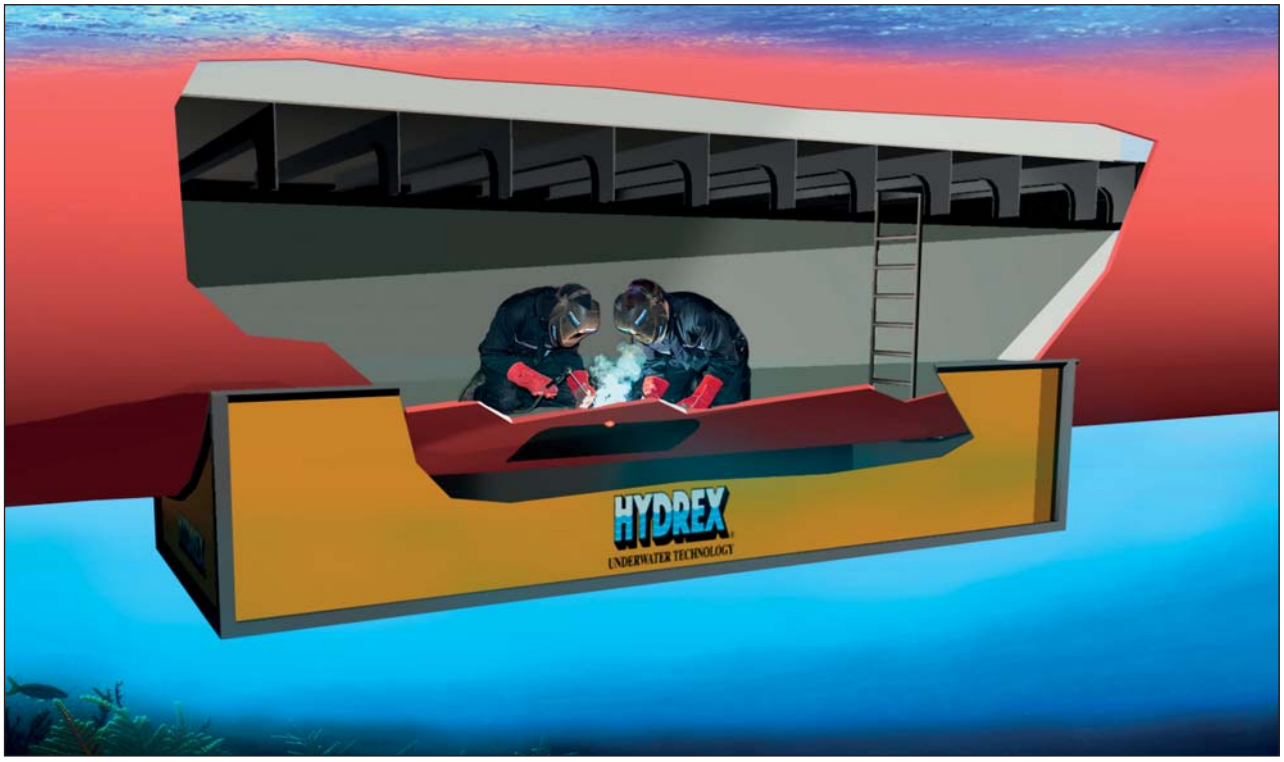
**KEEPING SHIPS IN BUSINESS**

# Fast underwater ship 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 mobdocks. 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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# 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 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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