HYDREX®
UNDERWATER TECHNOLOGY

NEWS
LETTER | 228

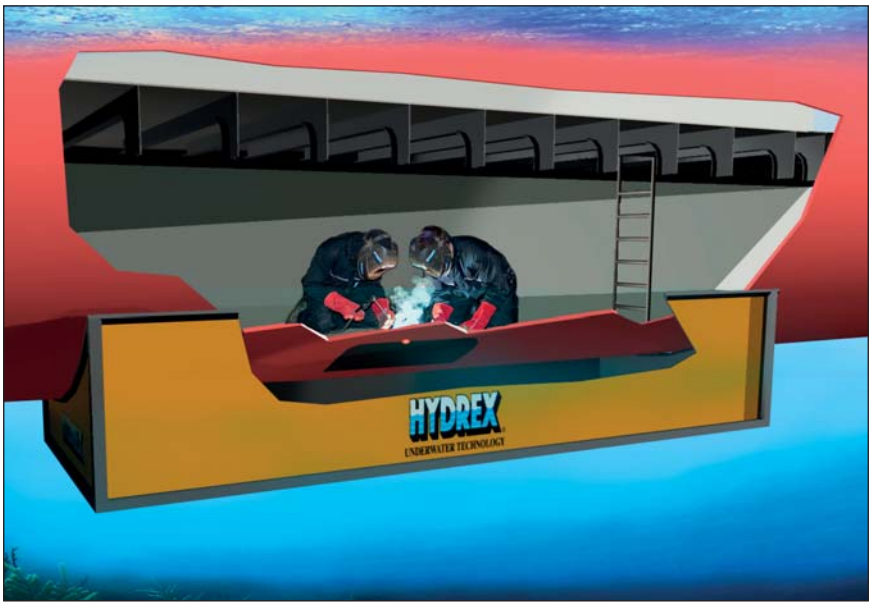
Contents

KEEPING SHIPS IN BUSINESS

ISO 9001 certified

Underwater services and technology approved by:

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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A thriving company in constant search of new opportunities

September 2015 saw the start of a large expansion of the Hydrex headquarters in Antwerp. This expansion is the logical result of the growth we have undergone in the last couple of years.

The construction of new offices has been finished. These offices and meeting rooms will accommodate the constantly growing staff of our headquarters. At the same time we have started a total refurbishing of the existing offices and warehouses as well as the exterior of all buildings. A totally new workshop has also been added to the existing locations and new training facilities are in the works, bringing the total area covered by our premises to over 5.000 m².

Being located at the Asiadok has always made the Hydrex headquarters ideally suited to mobilize our workboats to operations in Belgium, the Netherlands and France. A wide range of state-of-the-art equipment and tools is available at all times in our fast response center and can be loaded onto the boats immediately. A recent extension of the quay space available to Hydrex has increased the logistic possibilities even further.

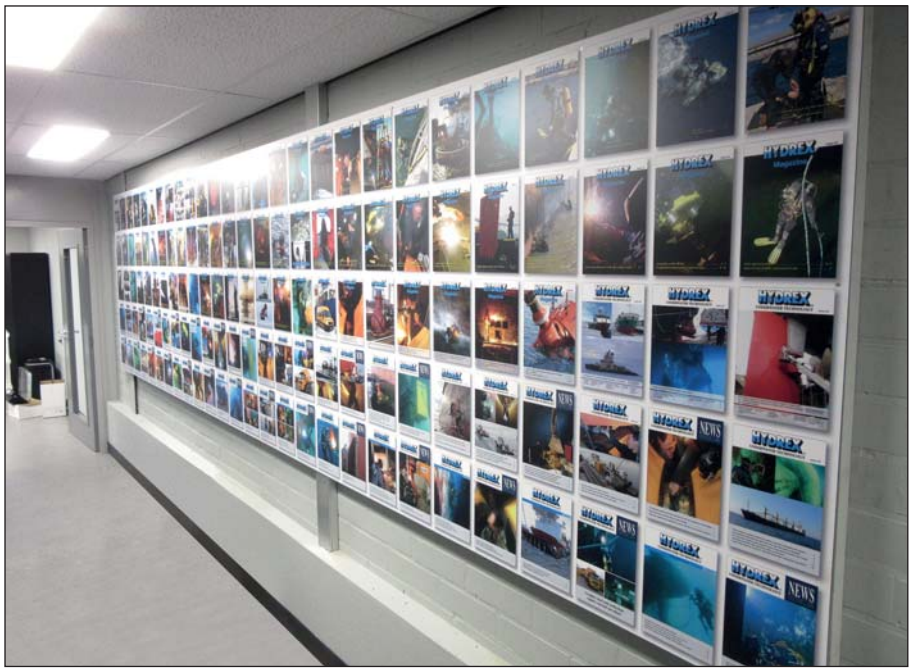
Besides the headquarters in Antwerp, Hydrex has two other offices ready to mobilize to operations

Construction of new offices at Hydrex headquarters in Antwerp.

The outside of existing buildings being totally refurbished.

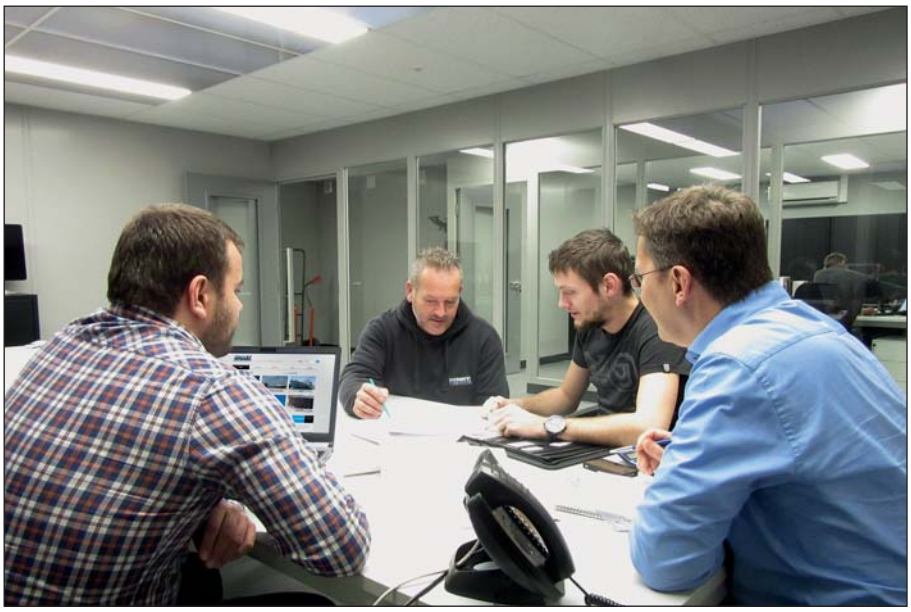
around the world. Our premises in Clearwater also cover over 5.000 m² while the office in Algeciras covers an area of 400 m².

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. New team members have been recruited in all areas. They need the best possible work environment to deliver the best possible quality for our customers. ■



Installing a bit of history on the wall of the new office.

Hydrex premises with extended quay space.



Hydrex personnel discussing an operation in one of the new meeting rooms.

Mobilization for an operation in the fast response center.

Hydrex workboat arriving back at headquarters after operation.

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 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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In-house R&D keeps Hydrex at the cutting edge of underwater ship repair

From the very beginning Hydrex' goal has been very simple: to keep ships in business. We achieve this goal by offering our customers afloat solutions to any problem that arises with the underwater part of their vessel. Unscheduled and costly drydock visits are prevented in this manner.

If you have a problem with a ship we will evaluate the problem and let you know whether an underwater solution is feasible.

Throughout our history we have always been at the forefront of technological developments in our field of expertise. We continue to invest in the research required to keep evolving the techniques available to our teams.

These teams consist of diver/technicians who cooperate closely with our Research & Development department and adapt to difficult or changing circumstances. It is very important that they can keep to the highest quality and safety standards during any operation.

It is the combination of their practical experience and the know-how of our R&D department that allows us to deliver a wide range of turnkey underwater repair and maintenance services around the world.

Over the years our in-house Research & Development department has kept improving the flexible mobdock technology.

Over the years our in-house R&D department has kept improving the equipment and techniques our diver/technicians use for the wide range of services we offer. A good example of this is the flexible mobdock (mobile mini drydock) technique. This makes it possible for Hydrex to perform permanent dry repairs on seals, thrusters and almost any other part of the underwater vessel on short notice without going to drydock. Another example is our cold straightening equipment. New versions of this machine are regularly put into practice, increasing the range of damage we can repair without cropping.

Our R&D department can also take care of the engineering aspects of operations that have to be tailor-made to the specific needs of the customer. These can be smaller operations with a limited time-frame that require speed and efficiency, or more complex repairs that usually take a lot more planning and require the construction of specific equipment.

Below you can find some examples of the many customized solutions our R&D department has designed for ship owners and managers in the last couple of years. During this period the company has considerably expanded both its size and the range of services it offers.

Permanent thruster repair system

A good example of such a solution is the design and installation of a permanent thruster repair and replacement system that is tailored to the specific shape and location of a vessel's thrusters. These systems are stored on board a vessel. If any repair work to the thruster comes up the system can be positioned very fast. Any problem can be dealt with

Permanent thruster repair and replacement system tailored to the specific shape of suction dredger.

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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Permanent thruster repair and replacement system.

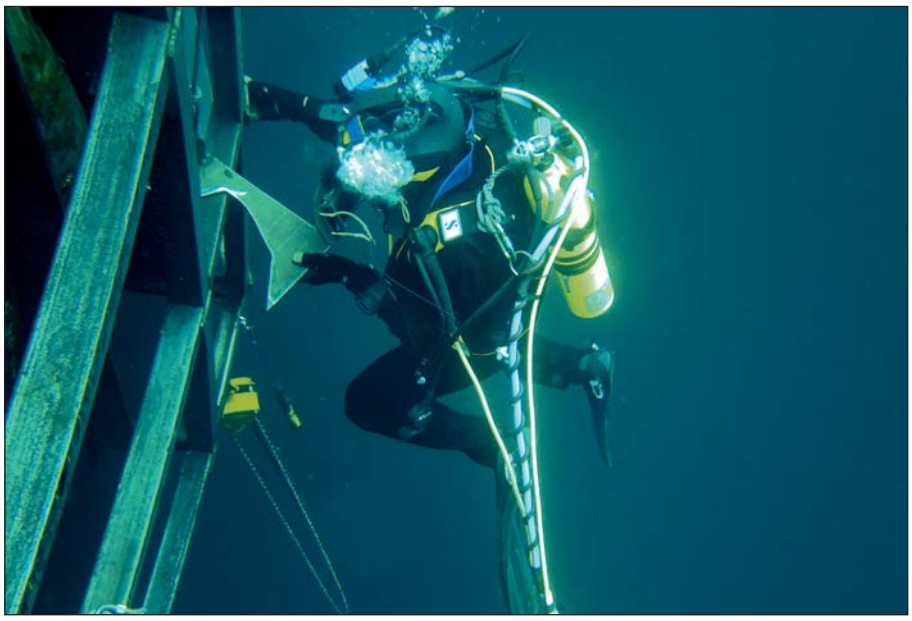
Underwater repairs allow ship to sail on after a 150-meter large grounding damage

When the shell plating of a 300-meter bulker was indented over a length of 150 meters after a grounding in the Suez Canal, a large crack 1.5 meters long appeared. To close off the crack and allow the vessel to continue its route to a drydock in China, Hydrex designed a repair plan in cooperation with a Marine Engineering and Naval Architect bureau.

much more quickly and easily. Systems like this have been designed for a large Offshore Support Vessel (OSV) and a suction dredger. Because the totally different size and shape of both vessels, our R&D department adapted the design so that it would fit the needs of the customer.

Hydrex designs cofferdam for underwater replacement of boss head bolts

Several boss head bolts of the main propeller of a ro/ro vessel were found to be missing. The manufacturer asked Hydrex to engineer a solution that would allow the replacement of these bolts underwater without having to go to drydock. In close communication with the manufacturer, the Hydrex engineering department designed a special cofferdam that would fit the specific needs of these operations. A special oil recovery system was incorporated into the design of system to prevent any oil from leaking into the water during the repair. The cofferdam has been used on several occasions since then for similar operations.



Special cofferdam covering 1.5 meter crack.

A special cofferdam was constructed to replace spinner cone bolts without going to drydock.

To get a perfect assessment of the way the shell plating had been buckled, a special frame was made and secured over the damaged area to get exact measurements of the distorted plating. These measurements were then used to create a special cofferdam that covered the crack and prevented it from growing further while at the same time providing extra strength for the underlying steel.

Propeller mobdock allows permanent repair work afloat

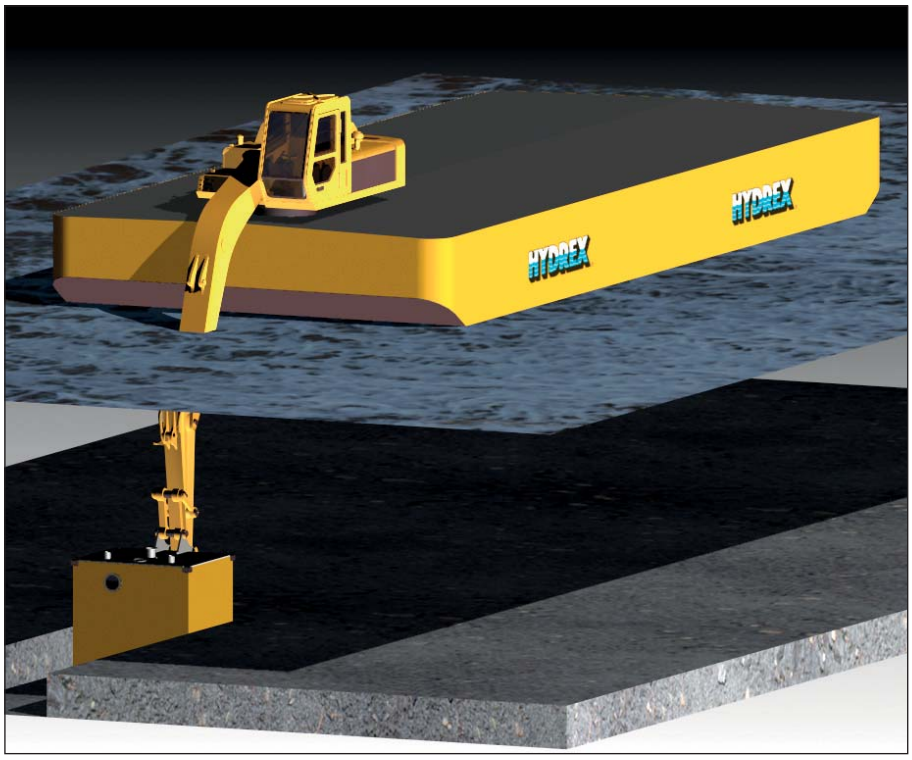
A ship builder delivered a new navy vessel but found during an inspection that there was a possible problem with the propeller blades. Because the ship was under warranty the manufacturer needed a quick and good solution to inspect the blades in dry conditions while the vessel stayed afloat. We designed and engineered an underwater repair technique based on our flexible mobdock technology. This allowed us to create a dry environment around the propeller and do the inspection underwater.

The propeller mobdock allows us to perform permanent underwater repairs to every type of propeller in dry conditions.

Using this system, permanent underwater propeller repairs can be performed in dry conditions. It gives us the possibility to carry out all kinds of repair or maintenance work to propellers, twin propellers, variable pitch propellers, azipod and collapsible thrusters.

Tailor-made blanking package

We also offer full blanking packages that are tailor-made to your vessel or fleet. These reusable blanks can be stored on board the vessel and can be easily installed whenever needed, at the most convenient time and location. Hydrex can also plan and execute the operation if needed. Despite the relative small scope of work, this nevertheless takes a lot of hassle and planning out of your hands, freeing up your time for other matters.



Hydrex has designed and patented a cost-effective method to remove polluted sediment.

Technological breakthroughs

Over the last few years our R&D department has also designed several technological innovations. Some will drastically improve the efficiency of repair and maintenance work while others will help clean up the oceans and protect the environment.

- Hydrex has introduced new welding techniques. We have also developed new equipment that

makes it much easier to monitor and test the weld seams.

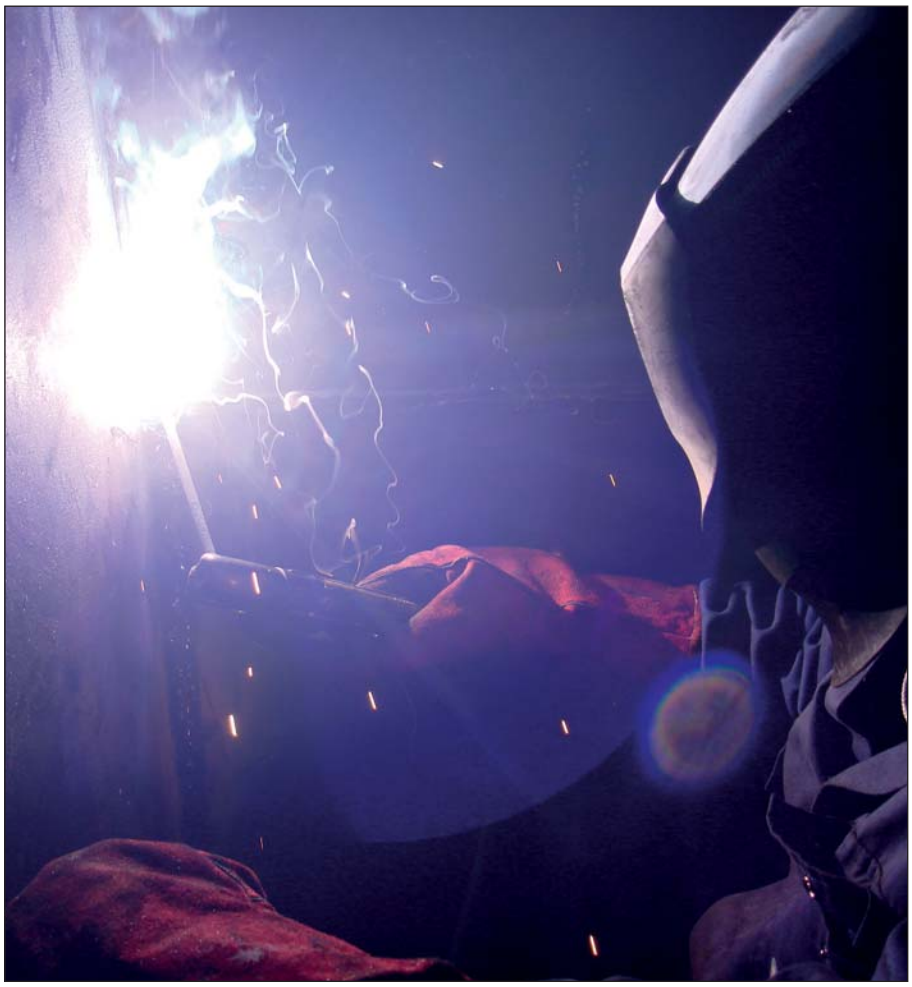
- A hull cleaning ROV has been designed in-house to make the cleaning of offshore vessels much more time-effective and easier to plan and execute.
- Hydrex has designed and patented a method to remove polluted sediment without creating turbidity[1] and eliminating dilution[2]. This Contained Dredging System (CDS) can be used on a worldwide basis and is highly cost-effective compared to the technologies that are currently available.
- Another revolutionary new technology consists of special water turbines that can generate massive amounts of energy from the water movement created by the currents. The efficiency of these turbines is much higher than of any other technology currently available.

Expansion and growth

The last few years have been very productive for Hydrex, with 2015 shaping up to be exceptionally fruitful. As you can read elsewhere in this magazine, we have just finished the construction of a large new office space and have already started a total refurbishing of the existing offices and warehouses. A totally new depot has also been added to the existing locations and new training facilities are in the pipeline. New staff is being recruited and trained, both on the office floor and in our diving teams. This ongoing expansion will help us to keep improving our services.

[1] Spreading of dredged material in the surrounding water

[2] Watering down of the dredged material causing an excess of material to be handled



Hydrex has introduced new welding techniques.

Conclusion

We keep evolving the repair techniques available for our diver/technicians. Along with the continual training of our entire staff this is done with the customer's benefit in mind. Our goals is to offer you the most efficient solution. In all cases the research and development is aimed at reducing cost and off-hire time for customers while maintaining the highest safety and quality standards of repair and maintenance.

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

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:
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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 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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