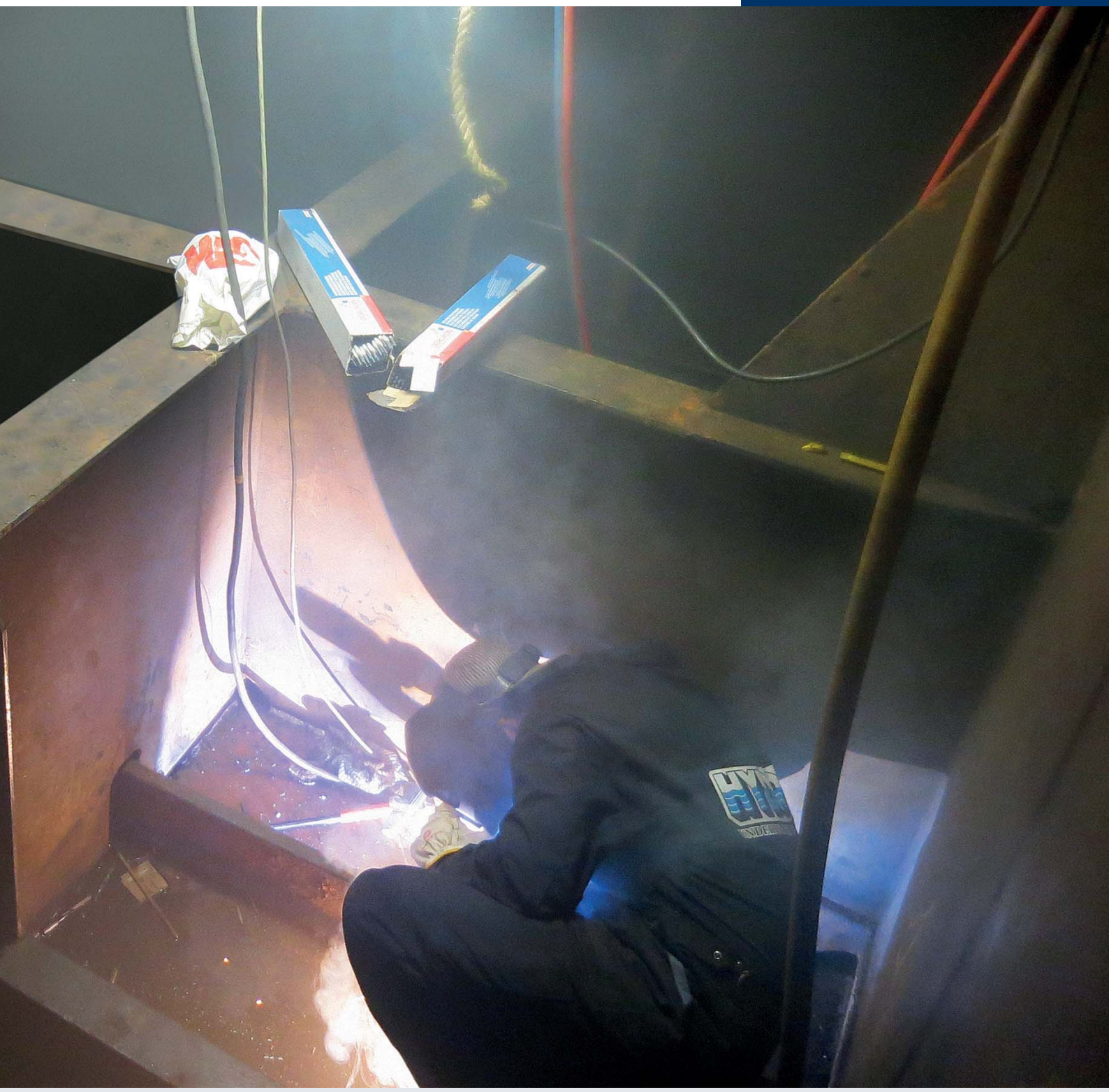
HYDREX®

UNDERWATER TECHNOLOGY

NEWS

LETTER | 248



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KEEPING SHIPS IN BUSINESS

ISO 9001 certified

Underwater services and technology approved by:

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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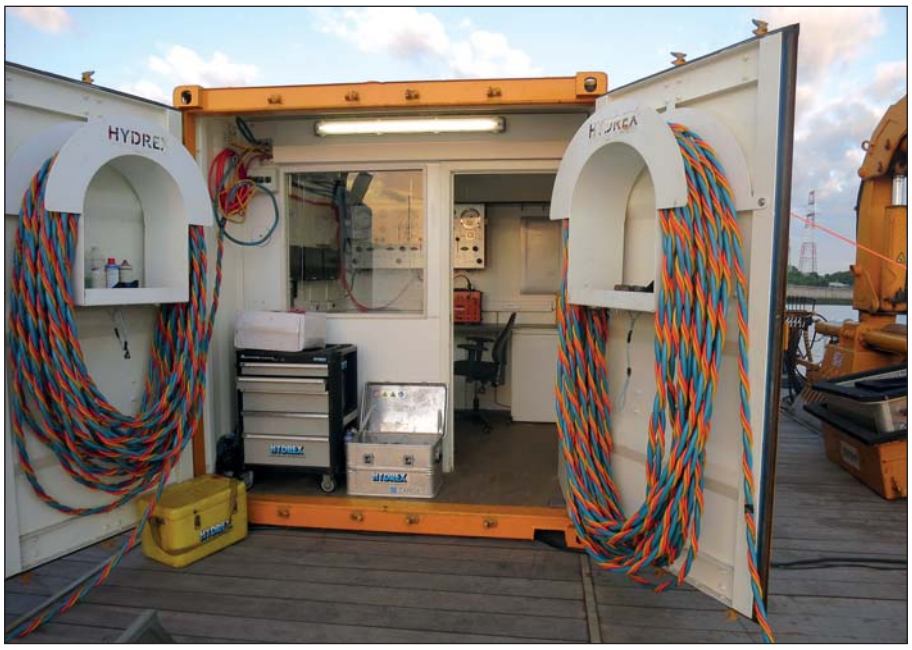
Wide range of hull repairs in Europe and North America

During the last month our teams flew across Europe and the United States. to perform a wide range of hull repairs on different types of vessels. In this article we will give you a summary of some of these operations. They illustrate the diversity of shell plating operations our diver/technicians are trained for.

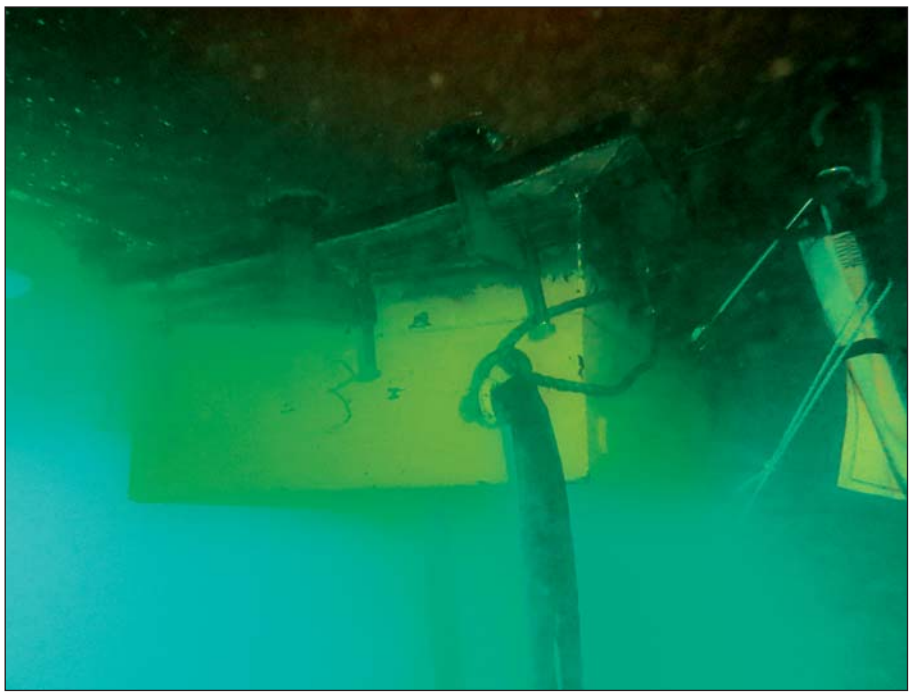


Hydrex monitoring station on one of our multi-purpose workboats.

Our class approved repairs combine both underwater mobdock installation and inside dry welding. Both parts of such an operation are performed by the same team of in-house trained diver/welders working at the highest technical standards.

Our permanent welding repairs include the following operations:

- Renewal of damaged hull plating, large or small areas
- Crack repairs by use of mobdock
- Pipe/flange repairs or replacements
- Clad welding of cavitated areas
- Inwater seachest installation
- Installation of speed log or echo sounder housing



Tailor-made mobdock secured over flat bottom of LPG tanker.

These operations are carried out afloat with the use of an external mobdock. In most cases normal commercial activities can therefore continue without disruption. We have a wide range of standard mobdocks available at our offices, but a tailor-made mobdock can also be created to fit a specific hull shape or purpose. This was the case during the flat bottom plating repairs in Port of Santander, Spain and Palm Beach, United States.

Mobdock designed to fit specific shape of hulls

Port of Santander

A 115-meter LPG tanker needed to have a new insert installed on a damaged section of its flat bottom.

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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One of our certified diver/welders adapting a mobdock to fit the hull of the roro vessel in Miami Beach.

New insert being secured with a full penetration weld.

Hydrex diving gear on one of our workboats, ready for underwater hull repairs.

Doubler plate ready for installation.

An offshore supply vessel in Oostende needed quick solution for a leak in its flat bottom.

Inspection of the damaged area.

Welded doubler plate on OSV.

Because the vessel had just left drydock in Port of Santander when the damage was discovered, going back to dock was not a feasible option. Our technical department was contacted and asked to design and install a special mobdock. This would allow the shipyard to perform the repair underwater in drydock-like conditions while the ship was berthed outside the yard.

A team of our diver/technicians traveled to Santander. First they performed a preliminary underwater inspection of the damage. This revealed that the required insert would be 400 x 300mm. Next they used a special frame to take the measurements needed to design the mobdock so that it would perfectly fit the rounded shape of the hull.

The mobdock was constructed at the shipyard following the design plan provided by our R&D department. When it was finished, it was installed by our team. The shipyard could then perform the insert repair in the best possible conditions. Once the repair was finalized and approved by the representative of the classification society, our team removed the mobdock.

The LPG tanker could continue its schedule without having to wait for a drydock space to become available, much to the satisfaction of both the owner and the shipyard that performed the repair.

Palm Beach

Besides designing and installing a tailor-made mobdock, our teams can also perform the actual insert repair. An excellent example of this was the operation performed in Palm Beach (U.S.A.) on a roro vessel.

The ship suffered corrosion damage to the aft starboard side shell plating. Because the damage was situated in the turn of bilge it was again essential that the mobdock was modified to fit perfectly over the rounded shape of the hull.

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 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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Corrosion damage in flat bottom of general cargo vessel in Antwerp.

One of the large doubler plates ready to be welded.

Finished weld seams of doubler plate on general cargo vessel.

Hydrex certified diver/welder working on one of the doubler plates in Antwerp.

After the mobdock was installed, the frame covering the damage was removed. This allowed the team to cut away the damage and the surrounding area. A new insert plate was then positioned and welded following our class-approved procedure.

An independent inspector carried out ultrasonic tests and the repair was approved by the classification surveyor who was present during the operation.

Doubler plate installation on general cargo vessel and OSV

Ostend

On the rare occasions where the damage does not allow a permanent repair, a temporary doubler plate is installed over the affected area. This allows the owners to keep sailing until the next scheduled drydock visit when they can arrange a permanent repair.

Such a repair was performed on an offshore supply vessel in Ostend (Belgium). A small hole situated on the starboard side of the flat bottom was covered. A minor repair like this can easily be carried out in less than a day without any interference to a ship's schedule.

Antwerp

The operation required on a leaking 198-meter general cargo vessel berthed close to our main office in Antwerp was a lot less straightforward. A detailed inspection of the affected area revealed corrosion damage in the flat bottom. The inspection also showed that the shell plating surrounding the damage was not thick enough anymore for an insert repair and in poor general condition. Installing a new insert plate was therefore not an option. Our technical department proposed to install 4 large doubler plates on the inside of the hull to cover the damage and the parts of the flat bottom that were at risk.

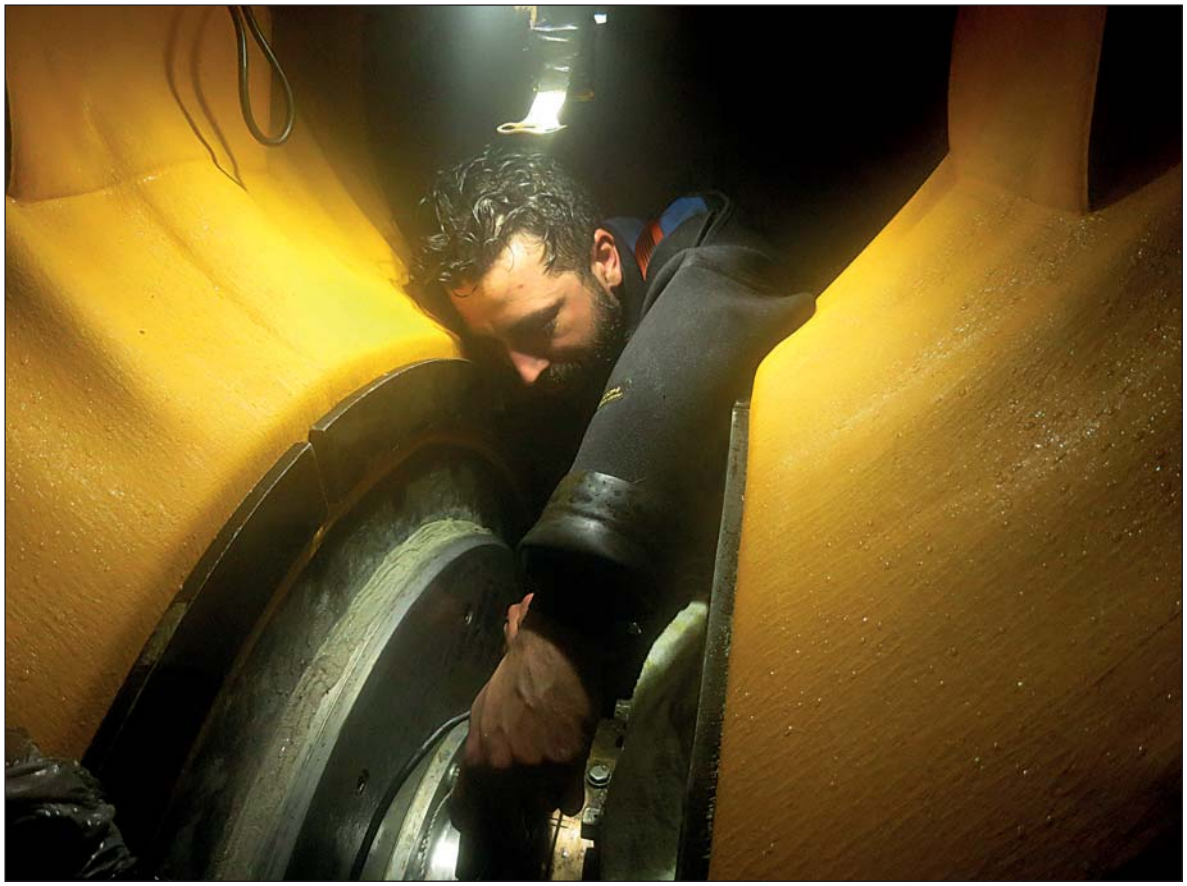
The plates had an average dimension of 1255 x 400 mm and were cut to size at our headquarter's fast response center. They were then fitted and secured by our diver/technicians. To prevent any further leaks, additional welding work was performed by our team on the rest of the area.

Detailed thickness measurements were requested by the attending classification surveyor to make sure the vessel could sail safely until the next drydock visit. As a result of our intervention the owner can now arrange this trip to drydock at a more convenient time and location.

Conclusion

We have the know-how and experience needed to find the best solution for any problem you might encounter with your vessel. This can be a simple routine repair or a unique complex one, as illustrated by these case studies. We can easily adapt a repair to your schedule. If required we can split up an operation and perform it in parts on different locations. Our goal is to keep you sailing with as little delay as possible. ■

In-water 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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Emergency afloat rudder operation in Le Havre

The rudder of a 250-meter crude oil tanker started showing wrong readings. An inspection uncovered that the rudder was not aligned correctly anymore and that its movements did not match the readings. The ship was unable to sail any further and an on-site solution was needed. A Hydrex diver/technician team therefore mobilized to Le Havre, France to perform an emergency repair operation.

Hydrex truck and equipment next to crude oil tanker.

After arriving at the vessel's location our team performed a detailed inspection of the rudder. This revealed that the rudder pintle needed to be removed to perform a permanent repair. The stormy weather conditions in Le Havre could cause the rudder to move, which would make it impossible to reinstall the pintle in-situ. For this reason it was decided that the ship needed to be towed to the nearest available drydock, in Brest for permanent repairs.

This changed the scope of the work completely. Because our teams are trained to handle challenging and constantly changing circumstances, they adapted to the new task without any problem or delay. We proposed to secure the rudder so that the vessel could be towed safely.


Hydrex technician preparing the rudder for the operation.

The team pulled the rudder to a zero angle. They also took the exact measurements needed to fabricate four securing plates that would fully lock the rudder in the neutral position. Once the plates were delivered, they were modified by the team to the correct size. Next they installed the stiffeners on both sides of the rudder. This would prevent the rudder from moving and causing further damage while the ship was towed.

Upon completion of the operation the attending surveyor, together with the superintendent and captain, inspected and approved the repairs. Thanks to our team the ship could be towed safely to Brest for permanent repairs.

Permanent on-site repairs with new technology

Because of the extent of the damage to the steering gear, drydocking was the only option for this ship. In most

While the first plate was installed, the next plate was prepared.

After the securing plates were installed, the ship could be towed safely.

cases, however, in-house developed rudder repair techniques allow Hydrex to perform permanent repairs while the vessel remains at anchorage. Cargo operations can continue uninterrupted, saving the owner precious time and money.

The equipment can be mobilized within hours to any port in the world. This enables us to offer this service on a worldwide basis. The technique enables engineers, welders and inspectors to perform their tasks in dry conditions with the vessel still afloat. Class approved permanent in-situ repairs are possible. Steel repairs or replacements can be performed and pintle and bushing defects can be remedied without the loss of time and money associated with drydocking. ■

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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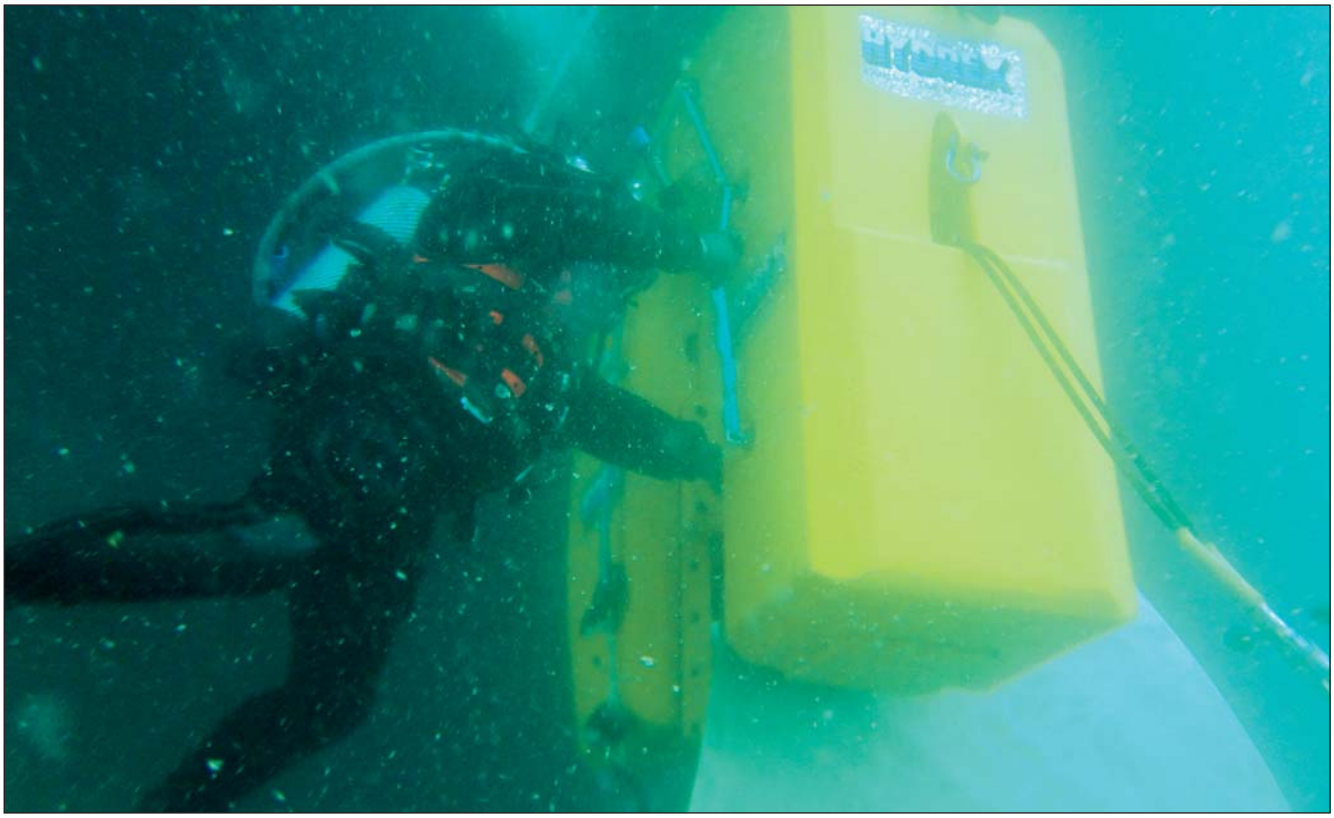
Hydrex certified welders securing the stiffeners.

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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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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