HYDREX®

UNDERWATER TECHNOLOGY

NEWS

LETTER | 304

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KEEPING SHIPS IN BUSINESS

ISO 9001 certified

Underwater services and technology approved by:

In-water bow thruster repairs

Our 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 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.

+ 32 3 213 5300 (24/7)
hydrex@hydrex.be
www.hydrex.be

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Emergency hull repair on ferry *Texelstroom*

When the vertical side of the ferry *Texelstroom* was damaged during storm Eunice, a leak in the ballast water tank prevented the ship from sailing. Because this happened at the start of a busy school vacation period, it was essential that a fast on-site solution was found to keep the downtime for the ship as short as possible.

Texelstroom sails between Den Helder on the Dutch mainland and Texel, the largest and most populated Dutch Wadden Sea island. As a UNESCO World Heritage Site, it is important that the area is protected. *Texelstroom* was designed with this in mind. Launched in 2016, it is one of the world's most sustainable ferries. It is the first ferry in Europe that runs on a combination of sustainable energy sources: compressed natural gas, green shore-side power and solar power generated on board.

An open-top cofferdam was constructed at our fast-response center in Antwerp.

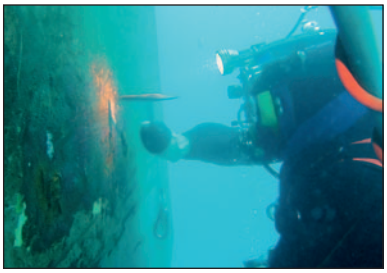
The ferry Texelstroom *sails between Den Helder on the Dutch mainland and Texel, the largest and most populated Dutch Wadden Sea island.*

Hydrex welder cutting away the old plating from inside the open-top cofferdam.

No time to waste

We were asked by TESO, the owners of the vessel, to find a way to repair the damage the ship had suffered during the storm. Because no drydock was available on such short notice, the operation needed to be performed while the vessel stayed afloat. Another important factor was the timeframe. Downtime needed to be kept to the absolute minimum so that *Texelstroom* could get back to ferrying passengers between Den Helder and Texel as soon as possible.

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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Fitting the new insert plate.

New insert seen from inside the vessel prior to welding.

Welding the insert from the inside.

The open-top cofferdam allowed the weld inspector access to the waterside of the affected area.

The insert was welded by our certified welders.

Finding on-site solutions and saving time are two things Hydrex has specialized in for almost 50 years now. Our Technical Department proposed installing an open-top cofferdam over the damaged hull plating. This would allow our diver/technicians to access the affected area and perform the needed repairs in dry conditions.

As soon as the proposal was accepted on Wednesday evening, we put everything in motion to start the operation. At this point we also contacted the classification society and stayed in communication with them throughout the entire operation. The cofferdam was constructed at our fast response center in Antwerp the very next day. We also ordered the certified steel for the new insert plate.

On Friday morning our team arrived in the port of Texel with the cofferdam and all the needed equipment. The repair started with a detailed inspection of the damage from both sides of the hull. In consultancy with the superintendent of the ferry and the surveyor from the classification society it was agreed to install an insert repair measuring 1500mm x 700mm.

The team then installed the open-top cofferdam over the damage and created a dry environment in which to work. They cut away the old plating and installed the new insert.

Insert after being welded from both sides.

Permanent new insert after completion of the repair.

Our men secured the insert with a certified weld both from inside the vessel and inside the cofferdam.

Ultrasonic testing was performed by an independent inspector and the repair was approved by the classification society as permanent. On Sunday morning, the cofferdam was removed and a final leakage test was successfully conducted. This concluded the operation.

Conclusion

Throughout the entire operation our Technical Department was in very good communication with the superintendent, the class surveyor and everyone involved.

The teams worked in shifts around the clock. This allowed us to complete the actual repair in just two days.

TESO's spare ferry *Dokter Wagemaker* had been bringing passengers to the beautiful Island of Texel during the *Texelstroom's* sick leave, but the ship was all better now and ready to sail again at full strength. ■

If you have any questions regarding a possible hull repair, do not hesitate to contact us. We are at your disposal 24/7 and ready to mobilize almost immediately.

+32 3 213 53 00
hydrex@hydrex.be

Scrubber pipe repairs and lasting protection

Exhaust scrubbers filter out all harmful toxins from exhaust gases of marine diesel engines. These hazardous pollutants can severely corrode the pipes of the scrubber. Using the experience we have accumulated over the years allows us to assist you at moment's notice if this happens.

We offer a full package to owners that are experiencing similar damage. Not only can we replace the corroded exhaust pipe while your vessel stays on schedule, but we can make sure that you will not have to call us again in a few months time for the same problem. This is done by coating the pipes with a highly corrosion resistant coating called Ecospeed.

Contact us for more information on scrubber pipe replacements or other underwater repairs. We are at your disposal 24/7.

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Underwater stern tube seal repair on container ship in Algeciras

Last month one of our diver/technician teams carried out an underwater stern tube seal repair on a container ship berthed in Algeciras. The ship was suffering from an oil leak, making an on-site repair necessary. Using a Hydrex flexible mobdock, the team was able to carry out the entire operation on-site and underwater, saving the owner an expensive and time-consuming trip to drydock.

Algeciras is an ideal location for seal repairs and other underwater operations. We have an office in the Port. Contact us for more information.

Once the operation was approved all preparations were handled swiftly and the lightweight equipment was mobilized almost immediately from our fast response center.

The operation started with a thorough underwater inspection of the stern tube seal assembly and removal of the rope guard. This revealed that a rope had become entangled around the stern tube seal assembly and had caused the oil leak.

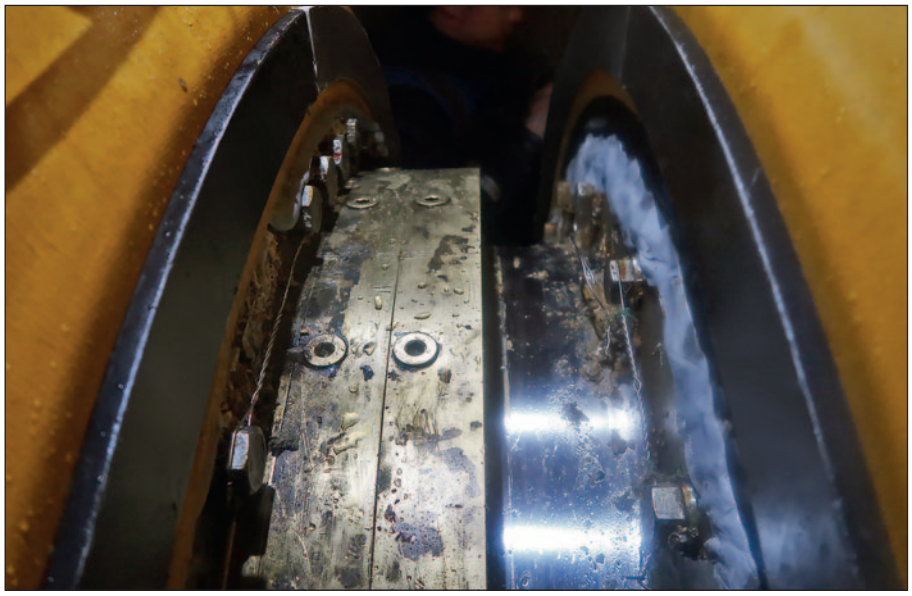
Our divers removed the rope during the inspection. They then cleaned the assembly and installed the flexible mobdock. By doing this they created a dry underwater environment so that they could work in dry-dock-like conditions.

The split ring was removed and brought to the surface to be cleaned. After cleaning the entire assembly, the divers removed the first seal and replaced it with a new one which was bonded. They then did the same for the other seals.

Working together with the OEM allowed us to provide our customer

Hydrex diver preparing the rope guard for removal.

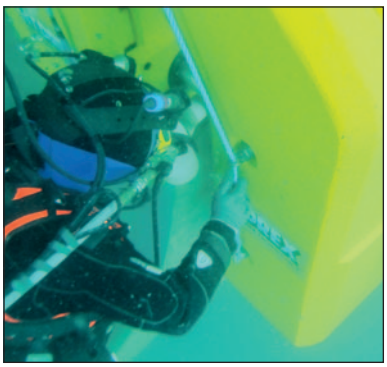
Fishing net tangled around the stern tube seal assembly, causing an oil leak.



Seal assembly prior to the repair.

First the rope guard was removed by our team, then our flexible mobdock was installed.

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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One of our diver/technicians working inside our flexible mobdock.

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

Working in drydock like conditions on-site

Taking advantage of the Hydrex flexible mobdock technique, the entire operation could be completed with the ship afloat and carrying out normal operations. Because all the required equipment is ready to be transported at all times, no time is lost making preparations.

Hydrex organizing everything from start to finish meant the owner did not have to worry about making any arrangements for the repair. After the seals had been successfully replaced he was able to sail his vessel to her next stop free of oil leaks.

We have developed a flexible mobdock repair method that enables the underwater replacement of all types and sizes of shaft seals. It allows ship owners to keep their vessels sailing, saving precious time and money.

Damaged stern tube seals will cause oil leaks or an ingress of water. By replacing the seals as soon as possible and in-water we can keep the down time low. Because seal repairs can be performed during cargo operations the ship can keep its schedule.

It is not always straightforward to replace seals. There can be considerable variation in the size of the stern tube itself and, for instance, the liners can be worn down and show ruts. However, all this is routinely handled by our experienced teams.

All our offices are equipped with the latest facilities, lightweight equipment and tools. This allowed for a timely arrival of our team in Algeciras with everything they needed to successfully complete the job. ■

If you have any questions regarding a possible seal repair, do not hesitate to contact us. We are at your disposal 24/7 and ready to mobilize almost immediately.

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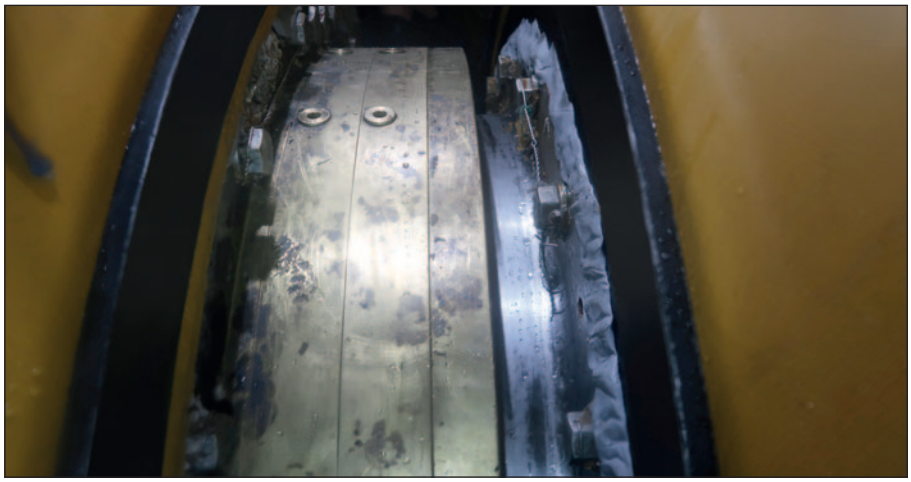
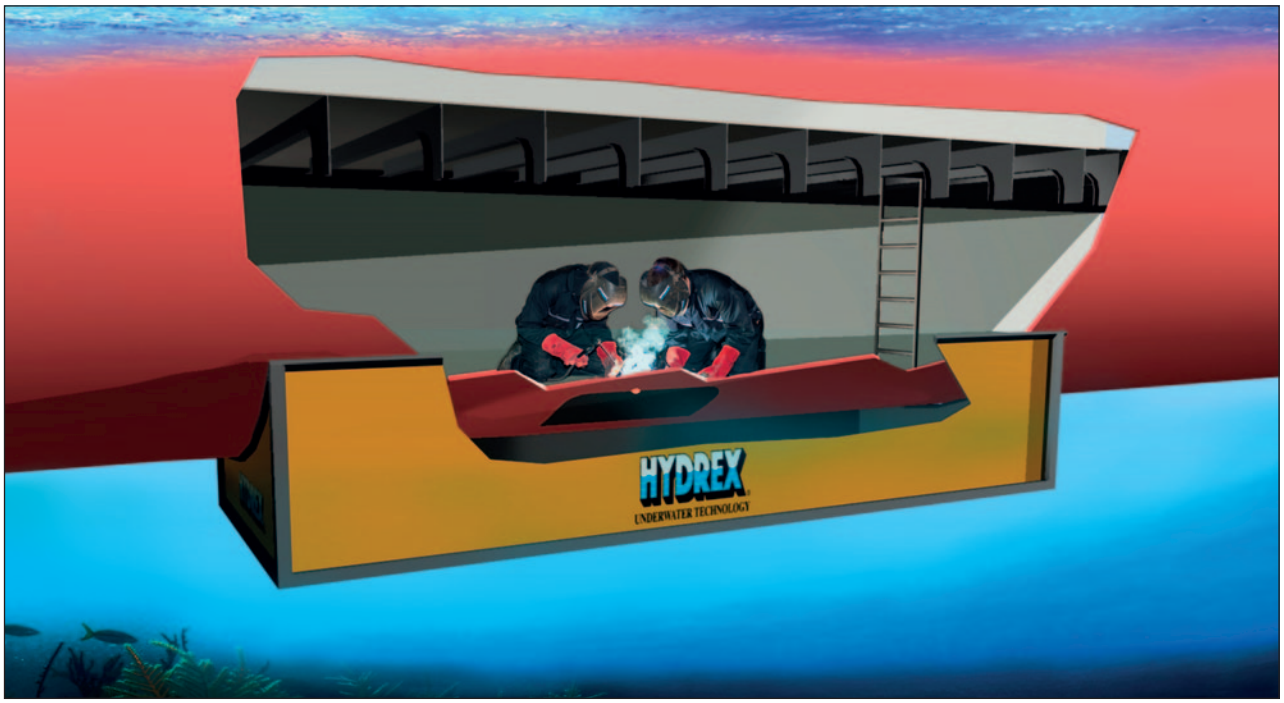


Stern tube seal assembly after the seal replacement.

The rope guard was reinstalled, concluding the operation.

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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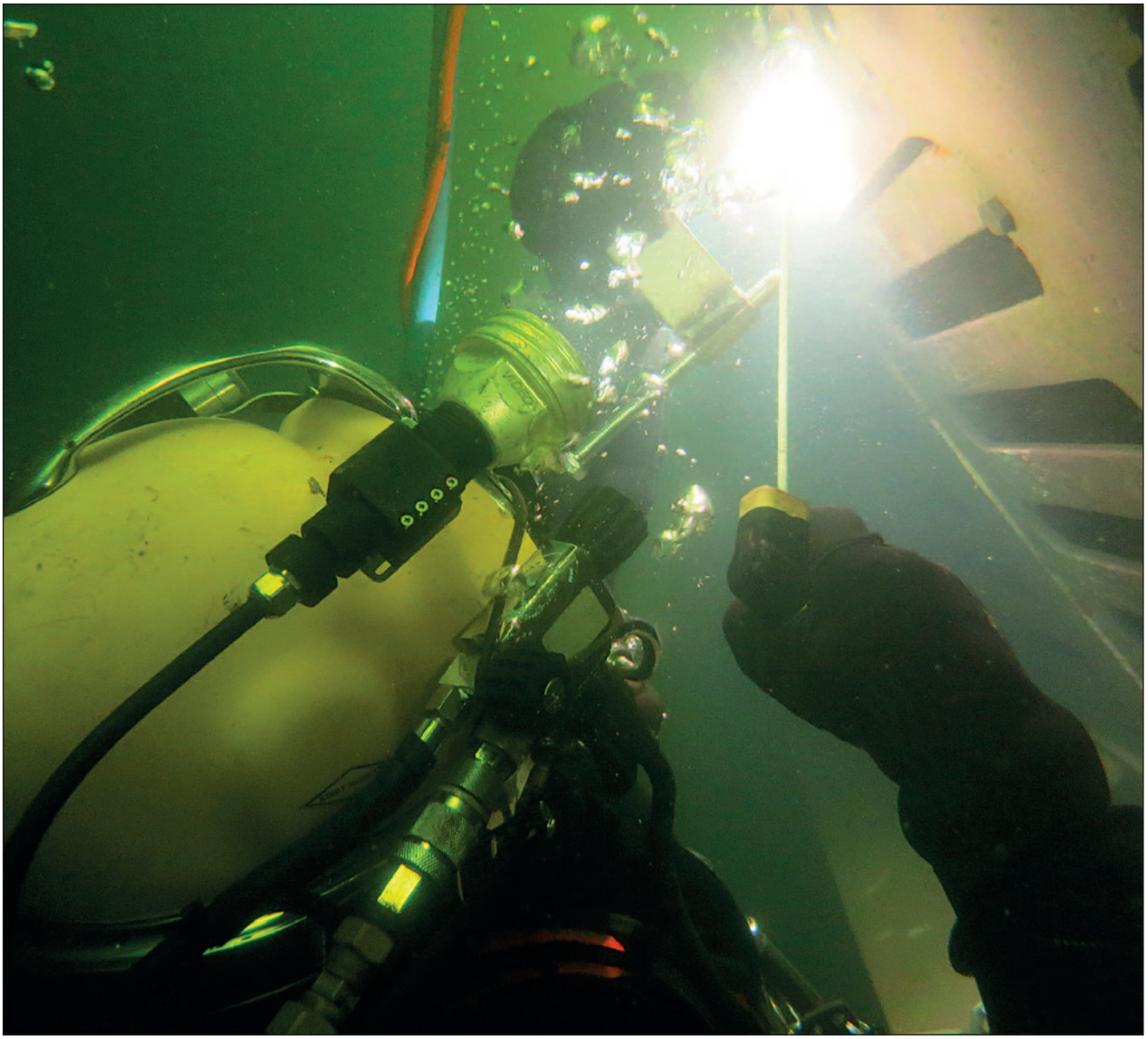

HYDREX®
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Headquarters Hydrex N.V. - Antwerp
Phone: + 32 3 213 5300 (24/7)
E-mail: hydrex@hydrex.be

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