HYDREX®

UNDERWATER TECHNOLOGY

Magazine

Number *283*

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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Editorial

In this magazine we write about several on-site operations carried out by Hydrex diver/technicians. These operations were performed with one purpose in mind: to keep the customer's vessel out of drydock and allow him to keep his ship on schedule.

Providing a service that is both versatile and effective, Hydrex has built a reputation as the world's leading underwater repair and replacement specialists. With an ever-expanding worldwide network of offices and support bases, we can provide fast service at reasonable costs.

If you have a problem with your ship of which you are not sure that it can be solved afloat, you are very welcome to give us a call. We will evaluate the problem and can let you know whether an underwater solution is possible. Many solutions are available without the need for drydocking.

We can assist you with routine maintenance operations as well as complex repairs. Very simply put: We fix ships.

Hydrex founder
Boud Van Rompay
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ISO 9001 certified

Underwater services and technology approved by:

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Seachest insert repair on tanker in Rotterdam

A tanker suffered leakage in the starboard side seachest of its engine room. We were asked by the owner to provide an on-site solution. For this reason we sent a team to the ship's location in Rotterdam.

We have our own workboats stationed in Rotterdam ready for immediate deployment throughout the port. After the workboat arrived next to the tanker, the team leader went on board and met with the captain and chief engineer.

The required on-board safety procedures were performed and divers started sealing off all 10 starboard side seachest grids using prefabricated steel plates. These were secured with the proper technique.

Hydrex team on its way to tanker in Rotterdam.

On request of the class surveyor, an NDT specialist was arranged to take thickness measurements of the starboard seachest within the engine room. These measurements showed that the damage inside the seachest was wider spread than expected.

Working closely together with all parties involved

With the result of this inspection, a complete repair plan was devised in cooperation between our teamleader, the ship's crew and the classification society.

While we finished the blanking of the grids, all preparations were made for the repair work in the engine room. This part of the operation would consist of the installation of two inserts in the seachest plating.

The blanking work was finalized soon after. The affected seachest could then be emptied of water and opened. The ship's crew removed all objects, including the water coolers and piping work, from inside the seachest.

Preparing blanks for installation.

Workboat next to tanker during operation.

Box cooler being removed from sea chest.

Certified welders for high quality repairs

The affected seachest plating was then cut away. Our team also took measurements of the port side seachest grids and openings to save time in case a similar repair would be required on that side in the future.

Our diver/welders worked in shifts to fit and weld the two insert plates. This was done with class approved full penetration weld.

When the installation was complete, a successful MPI test was carried out by an independent surveyor. As a result, the class representative gave his green light for the repair.

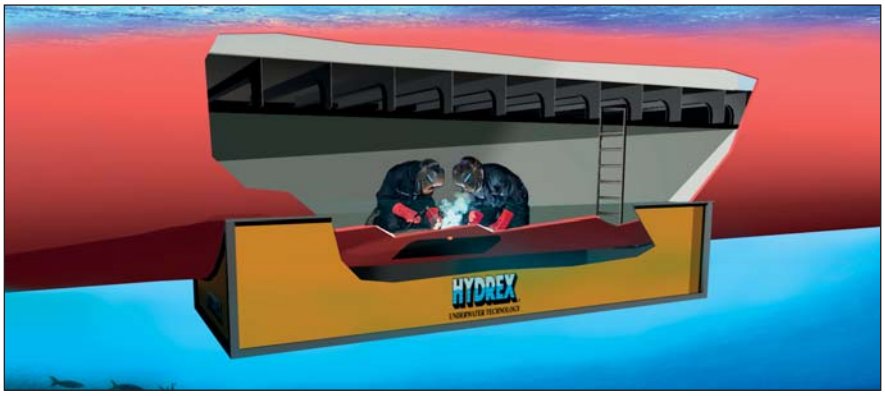
The ship's crew could then re-install everything in the seachest. Our team flooded the seachest and final tests were performed to make sure everything was watertight. The operation then ended with the removal of the blanks by our divers.

Conclusion

This operation is a good illustration of the many benefits we can offer shipowners.

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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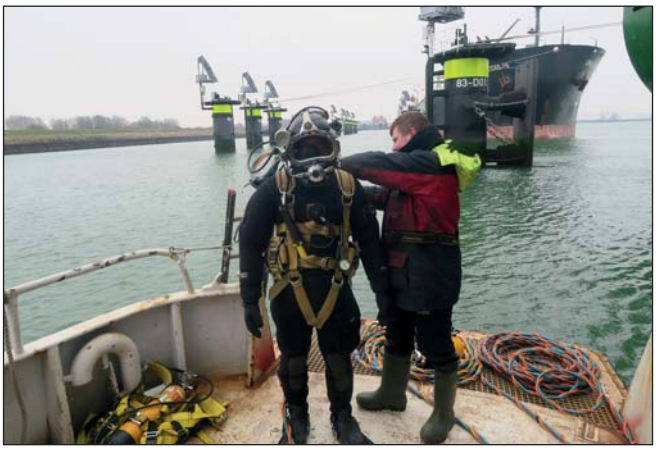
Positioning one of the new inserts.



Hydrex diver getting ready for underwater operation in Rotterdam.

Securing the new inserts with full penetration weld.

New inserts seen from inside the sea chest.

NDT testing of the welds.

Like all projects we undertake, we took on, organized and executed the entire job, start to finish. Throughout the operation we were in close communication with the customer, the classification society and any other party involved. We also provided all the equipment and materials needed for the repair. This relieved the customer of the hassle of coordination, planning and supervision.

Our offices in Antwerp and Rotterdam have workboats available for immediate deployment. These can be used for a wide range of operations in Belgium and the Netherlands. This allowed for a fast mobilization to the tanker's location.

Our team worked in shifts 24/7 to further shorten the timeframe needed for the repair. This was done to make sure that any loss of time was brought down to the absolute minimum.

The owner could continue his vessel on its schedule free of oil leaks and without a costly and time-consuming trip to drydock. ■

KEEPING SHIPS IN BUSINESS

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

Sea valves, sea chests and gratings
In-water inspection, cleaning and repair of intakes and valves, installation of new sea chests, condensers and coolers afloat.

Stern tube seal replacement
Permanent inwater stern tube seal replacements and repairs with the unique Hydrex flexible mobdock technique.

Propeller operations
Propeller cleaning with special tools, on-site blade straightening and cropping. Permanent repairs to all types of propellers or installation of propeller cone fins.

Rudder repairs
Permanent on-site repairs on all types of rudders with groundbreaking new technology.

Pintle and bushing repair and replacements

Fast propeller repair in Ghent avoids costly drydocking

Recently we performed a propeller blade cropping on a 180-meter bulker berthed in Ghent. The tip of two of the four propeller blades was severely damaged and needed to be cropped to restore the propeller's efficiency. The trailing edge of the other blades had suffered cracks that needed to be repaired.

Having developed different procedures for different kinds of damage, Hydrex teams are equipped and trained to make the best out of a bent or broken propeller. Ideally, the in-house developed cold straightening technique is used. This procedure enables us to straighten damaged blades in-water, allowing commercial operations to continue without the need to drydock.

Trimmed propeller blade of bulker with damaged tip.

Dye inspection of the blade after cropping.

In the following example cropping was the only option as the type of damage to the propeller blade did not allow cold straightening. In cases like this, where there is an even number of blades an identical piece will be cropped from the opposite blade to restore the hydrodynamic balance of the propeller. By doing so, the best possible efficiency is obtained.

Single day operation restores efficiency

Two of the four blades of the bulker had lost part of their tip. An on-site solution was needed to restore the propeller's balance and efficiency. A team was therefore mobilized

Blades can also be cropped underwater by our diver/technicians if needed.

from our headquarters in Antwerp to the ship's location in Ghent.

After the equipment arrived at the vessel our men started the operation with a detailed survey of the propeller blades. They used the information acquired during the inspection to calculate and determine the correct measurements needed to modify the propeller blades. The first blade was then cropped and ground to give it the correct radius. The opposing blade was modified using the exact same cutting line, to give the propeller back its balance.

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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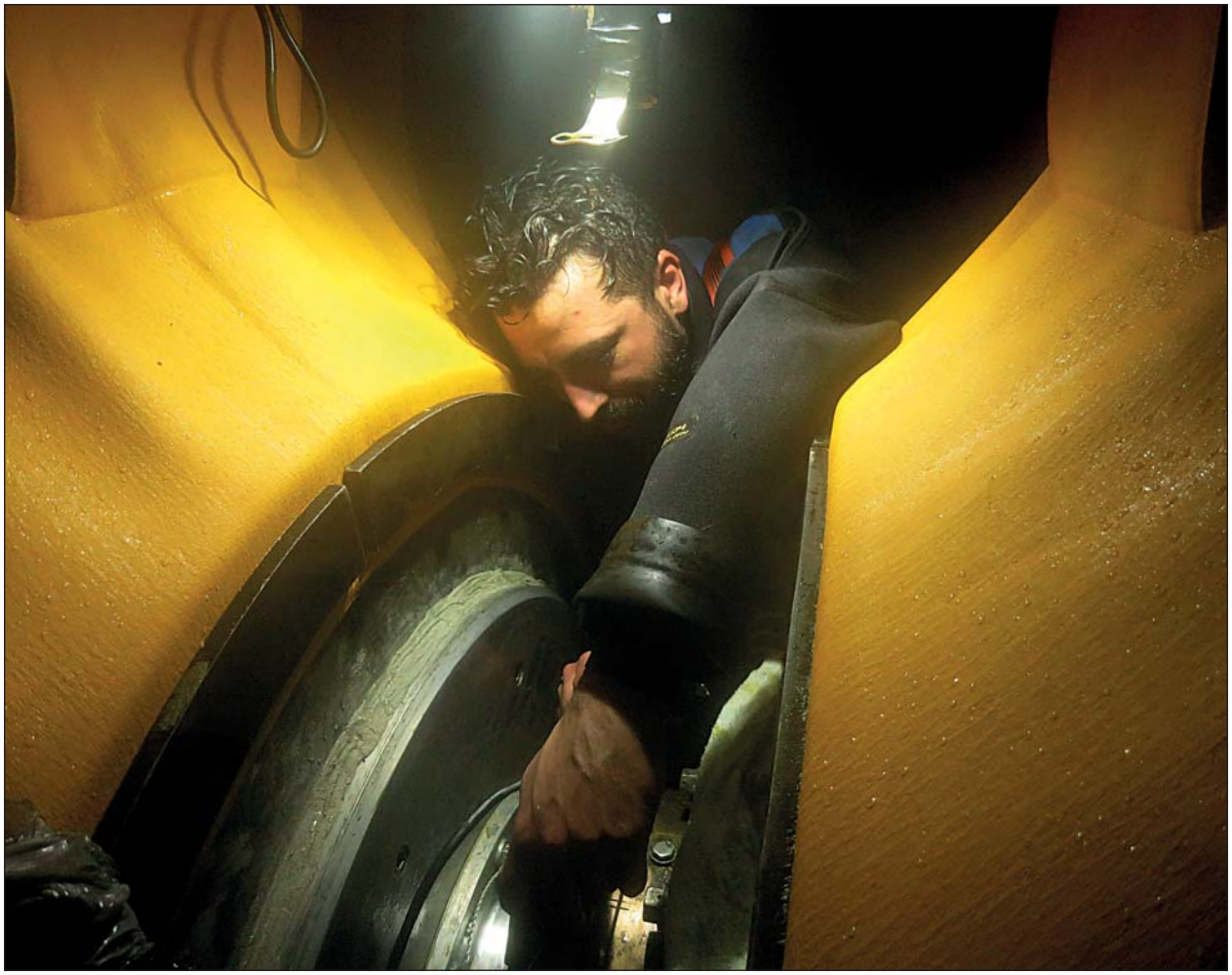
Stern tube seal repairs



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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If possible, bent blades are restored with our cold straightening machine.

The edges of the affected blades are polished for maximum efficiency.

When the cropping was complete, small cracks were grinded out of the trailing edges of the other blades. This was done to make sure that any remaining loss of efficiency would be minimal.

Conclusion

Over 45 years of experience with propeller repairs have given us the tools and know-how to offer fast repair and modification services to vessels around the world. All types of operations can be carried out fast and efficiently afloat and under-water.

In this case the repair took less than a day. This prevented any unwelcome delay to the vessel's schedule. ■

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

Hydrex receives grade A wet welding certificate

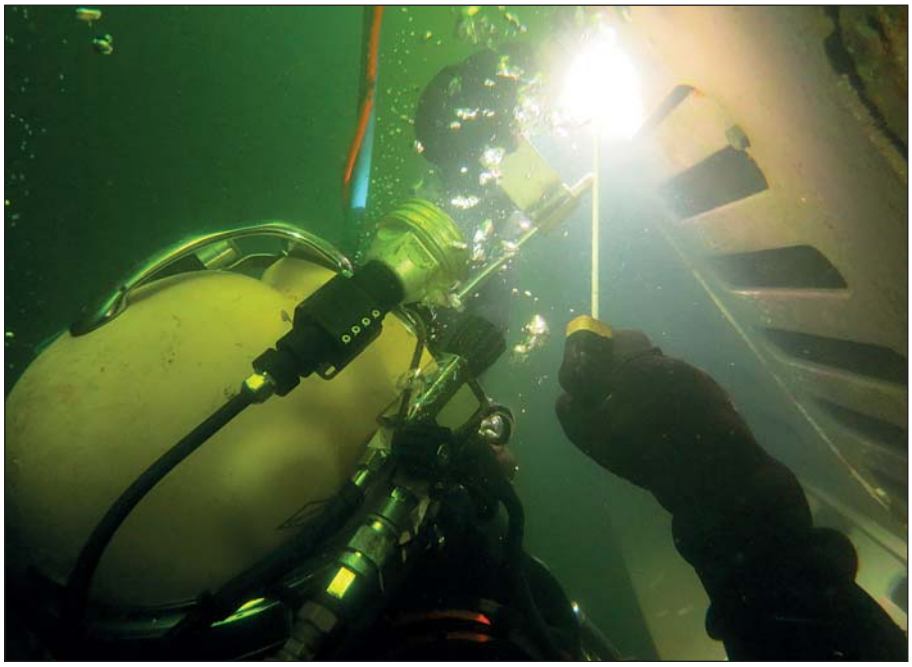
We have received the approval to carry out classification certified *grade A* wet welding. To guarantee the required high standard of these underwater welds, NDT tests were performed by ABS surveyors before the certificate was awarded.

The certificate was given to carry out grade A *groove welding* underwater. Cavitation or corrosion damage on rudders, clad welding, rope guard repairs, mewis duct repairs, … can now be done with permanent welding.

With a class B weld an inspection of the weld is required every three months. With class A welding the deadline for an inspection is much longer. This is decided by the attending surveyor on a case by case basis.

Any required inspection will be for the underlying problem causing the damage and not for the welding work. An internal structural problem causing damage will not always be handled after the repair and will need to be followed up. For instance, doubler repairs can never be permanent because the doubler is installed over the damaged plating instead of replacing it (as is the case with insert repairs).

With class A underwater welding only a note is made stating that the affected area needs to be looked at during the next scheduled inspection. This is very important for tankers as a clean class certificate is requested by most charterers.



We have received the approval to carry out classification certified grade A wet welding.

Even for non-class items such as rope guards the certificate is useful because it shows our customers that our diver/welders can carry out high quality underwater welding work. This is a major benefit for offshore units where high quality standards need to be verified before welding operations like doubler repairs can be performed. ■

Weld seams of doubler plate installed over damaged hull area.

Large fuel savings with new propeller surface treatment technique

We discovered an unsophisticated but very efficient technology to enhance propeller blade surfaces. With this method we can achieve surface conditions that were never seen before. This can only be done underwater.

We have four workboats equipped to deliver this service on a very short notice in the Rhine-Scheldt delta from Antwerp to Rotterdam.

When a comparison is made between the surface condition of an average propeller, as our divers regularly see it, and the smoothness that is obtained with our cleaning technique, savings are in the 5-10% range. These results are easily achieved. The cost of such an operation is very attractive and is very easily gained back in a matter of days (or even hours).

Regular maintenance is easy to schedule and results in ultra-smooth propeller surfaces. Continuous and large fuel savings are now possible.

This award-winning surface treatment technique justifies having the propeller cleaned every time it calls a port.

Please contact us for more information, we will gladly discuss the benefits of this new technology with you.

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We fix ships worldwide

This drawing was made in 1979 and symbolizes our care and attention for ships.

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