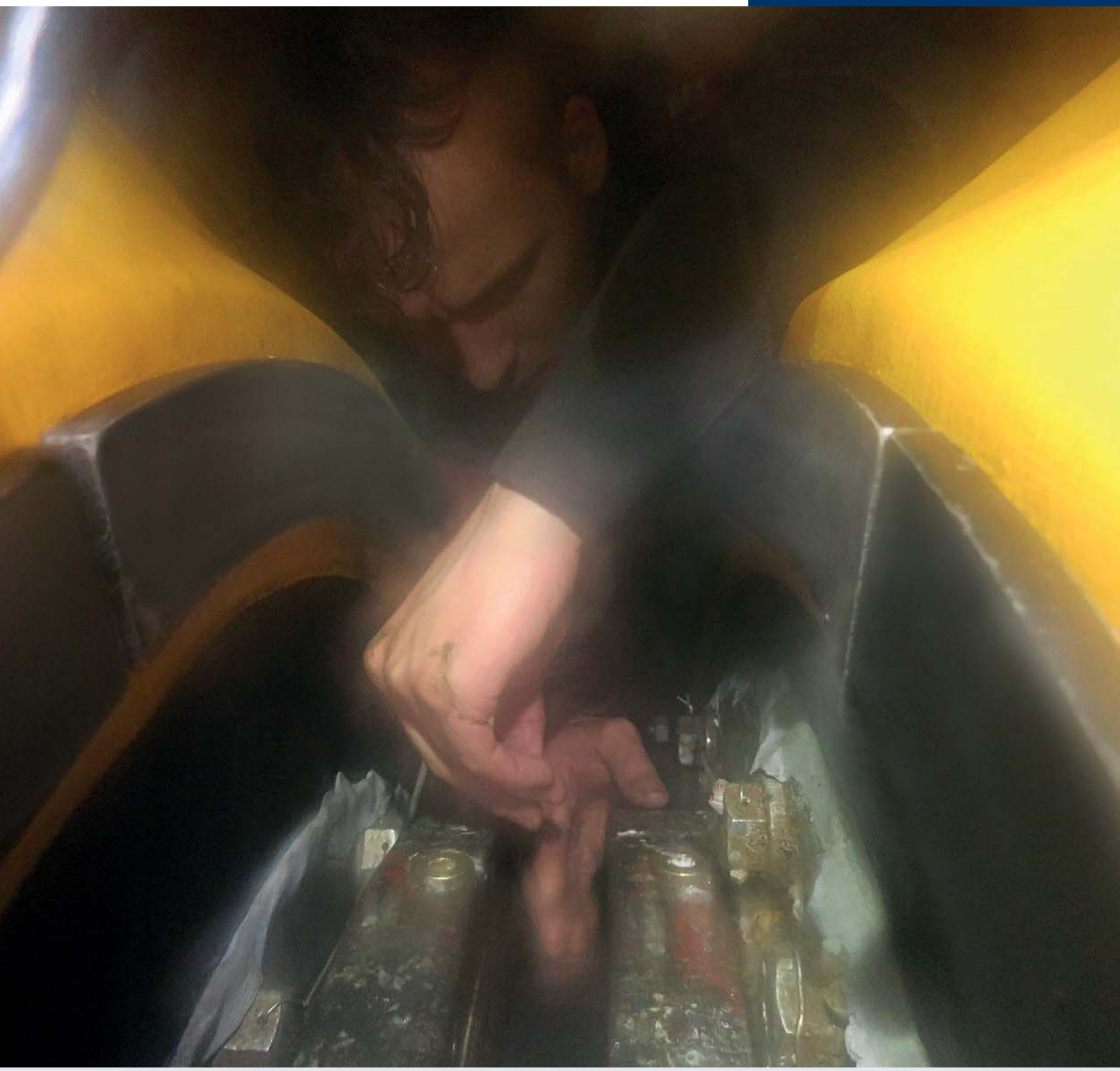
HYDREX®
UNDERWATER TECHNOLOGY

NEWS
LETTER | 222



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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 the 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.

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Dry shaft seal renewal underwater in Australia

In May a Hydrex diver/technician team carried out underwater stern tube seal repairs on a 200-meter roro vessel in Port Kembla, Australia. The ship was suffering from an oil leak, making an on-site repair necessary. Taking advantage of the Hydrex flexible mobdock technique the team was able to carry out the entire operation on-site and underwater.

The team worked in shifts around the clock.

A leaking seal is always an unpleasant experience for a ship owner. It will force him to go off-hire, costing him time and money. To avoid going to drydock and keep the loss of time to the absolute minimum, Hydrex has developed the technology that enables repairs or replacement of all types of shaft seals to be carried out afloat. The ship can keep its schedule as seal repairs can be performed during cargo operations. By creating a dry underwater working environment around the shaft, work on the seal assembly can be performed in dry conditions. This is done by using our flexible mobdocks which are designed specifically for this type of repairs. They fit all sizes of seal assembly.

The following case study gives an account of a recent underwater stern tube seal repair performed by Hydrex.


Stern tube seal repairs can be carried out afloat with our flexible mobdocks.

Leaking stern tube repaired on-site

Immediately after the operation was confirmed our technical department arranged for a rapid mobilization of a team of Hydrex diver/technicians to the roro vessel's location in Australia, together with all the needed equipment.

The diving team first set up a monitoring station. The operation then started with a thorough underwater inspection of the stern tube seal assembly.

Hydrex lightweight equipment can easily be transported around the world.

After the inspection, the team detached the vessel's rope guard. Next the divers installed the flexible mobdock around the stern tube seal assembly creating a dry underwater environment so that they could work in drydock-like conditions. The split ring was then disconnected and brought to the surface to be cleaned. After cleaning the entire assembly, the team removed the damaged seals one by one and replaced them with new ones.

Stern tube seal assembly prior to cleaning.

All parts of the stern tube seal assembly were then reinstalled and secured. Leakage tests were carried out with positive results, after which the divers removed the flexible mobdock. The operation ended with the reinstallation of the rope guard.

Fast worldwide response

Every Hydrex office has a fast response center equipped with all the latest facilities, equipment and tools. These centers were designed specifically to increase speed of service. The lightweight flexible mobdocks packed in flight containers allow for a very fast mobilization and a timely arrival of Hydrex teams on any loca-

Inspection of the old seals inside the flexible mobdock.

Hydrex diver/technician working on the assembly underwater.

tion around the world with everything they need to successfully complete the job.

Summary

Damaged stern tube seals will cause an increasing amount of oil leaking or water ingress as the damage worsens. By replacing the seals when the damage is first discovered Hydrex keeps the down time low.

The team worked in shifts to perform the stern tube seal repairs within the shortest possible time frame. This allowed the owner to let the ship continue its schedule without unnecessary delay, saving him precious time and money. ■

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 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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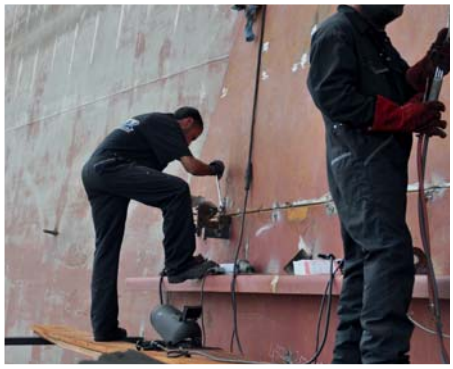
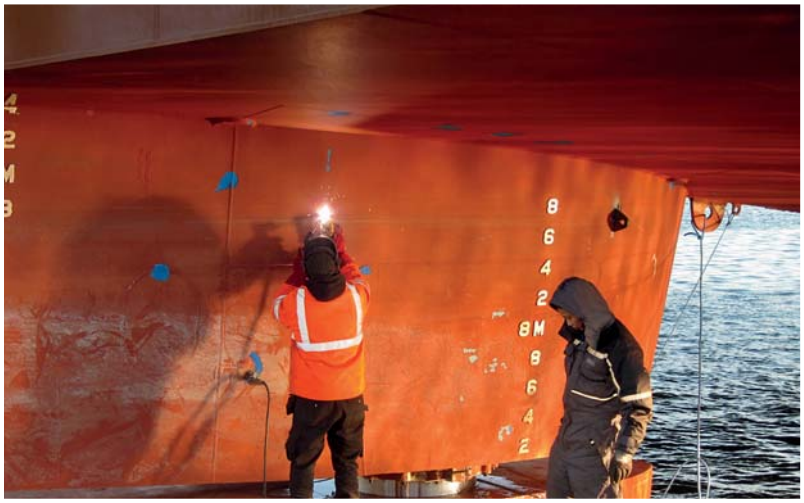
Workboats available for afloat and underwater repairs

Hydrex has dive support workboats available at the company's headquarters in Antwerp. The boats can be used for a wide range of operations in Belgium, the Netherlands, the United Kingdom and France.

- afloat ship repairs alongside the vessel
  - ✓ stern tube seal replacements
  - ✓ thruster operations
  - ✓ propeller repairs
  - ✓ stabilizer fin repairs
  - ✓ shell plating repairs
  - ✓ ballast tank repairs
  - ✓ overhaul of winches
  - ✓ welding repairs
  - ✓ anchor chain replacement
- ideal for operations in hard to reach areas on ship hulls
- equipped for maintenance or repair work
- available with crew and repair technicians
- fully equipped as dive support with hydraulic cranes, hydraulic winches, nautical and communication equipment and dive control rooms.
- based in Antwerp.
- available for fast mobilization to
  - ✓ Rotterdam
  - ✓ Antwerp
  - ✓ Ghent
  - ✓ Zeebrugge
  - ✓ Flushing
  - ✓ Terneuzen



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On-site propeller operations keep your ships sailing

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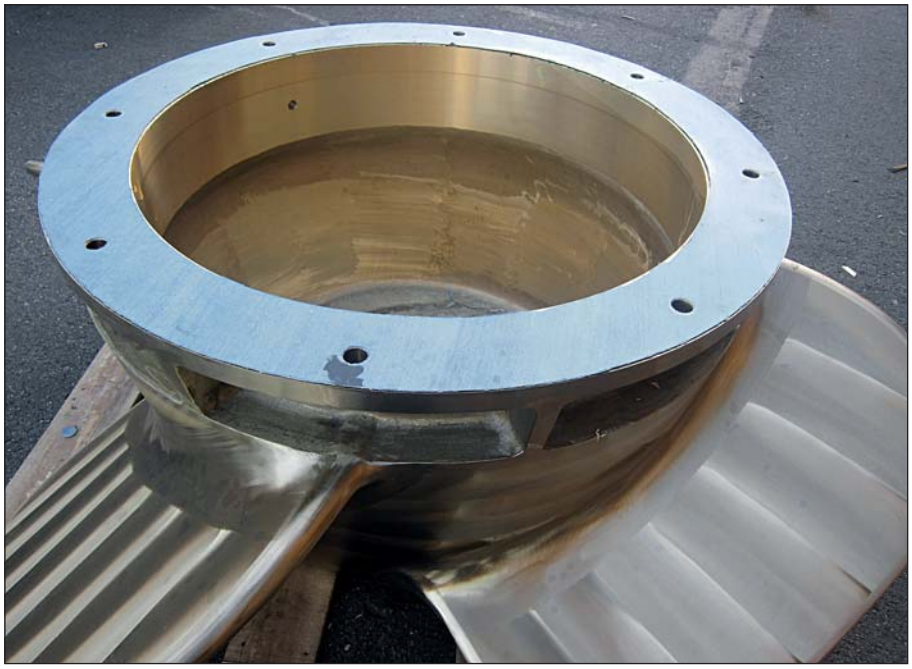
Underwater propeller cone fin installation offers immediate fuel savings

Last month Hydrex installed a propeller cone fin on a general cargo vessel. This operation was carried out in Antwerp, but can be performed economically almost anywhere. As a result of the underwater operation an owner can instantly start benefitting from the fuel savings a propeller cone fin brings. He does not have to wait until the next scheduled drydocking for the installation.



Propeller cone fine ready for installation.

Propeller caps like these can recover energy loss of a propeller hub vortex in the propeller's slipstream. This decreases fuel consumption from 3% up to 5% and reduces cavitation on rudders and hulls. Hydrex can install propeller cone fins underwater on any size and make of propeller, on both new build or in-service vessels.

Installation afloat prevents a long wait for fuel savings

Hydrex carries out these operations following the specific procedures required by the involved OEM, adapted for an installation afloat. A team of our diver/technicians mobilizes to the vessel's location. After a preliminary inspection the divers remove the propeller cap and clean the flange where the device is to be installed. They then lower the propeller cone into the water and position it on the propeller. The bolts are then put on torque and secured with wire if needed. Hydrex teams can work in shifts around the clock to finish the operation as quickly as possible.

The owner of the vessel can start enjoying the fuel savings the propulsion improving device creates right away. Having to wait for the next scheduled drydocking to have the propeller cone fin installed can lose

Hydrex equipment arriving on-site.

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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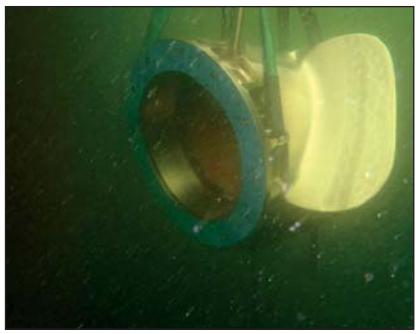
Hydrex can install all types of propeller cone fins underwater.

Hydrex workboat during propeller cone fin installation.



New propeller cone lowered into the water.

New propeller cone installed and secured in Singapore.

him up to two years of fuel savings. In contrast, he will have earned back the cost of the underwater installation in only a few months. The savings are considerable. ■

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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