HYDREX®
UNDERWATER TECHNOLOGY

NEWS
LETTER | 288

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Inwater 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.

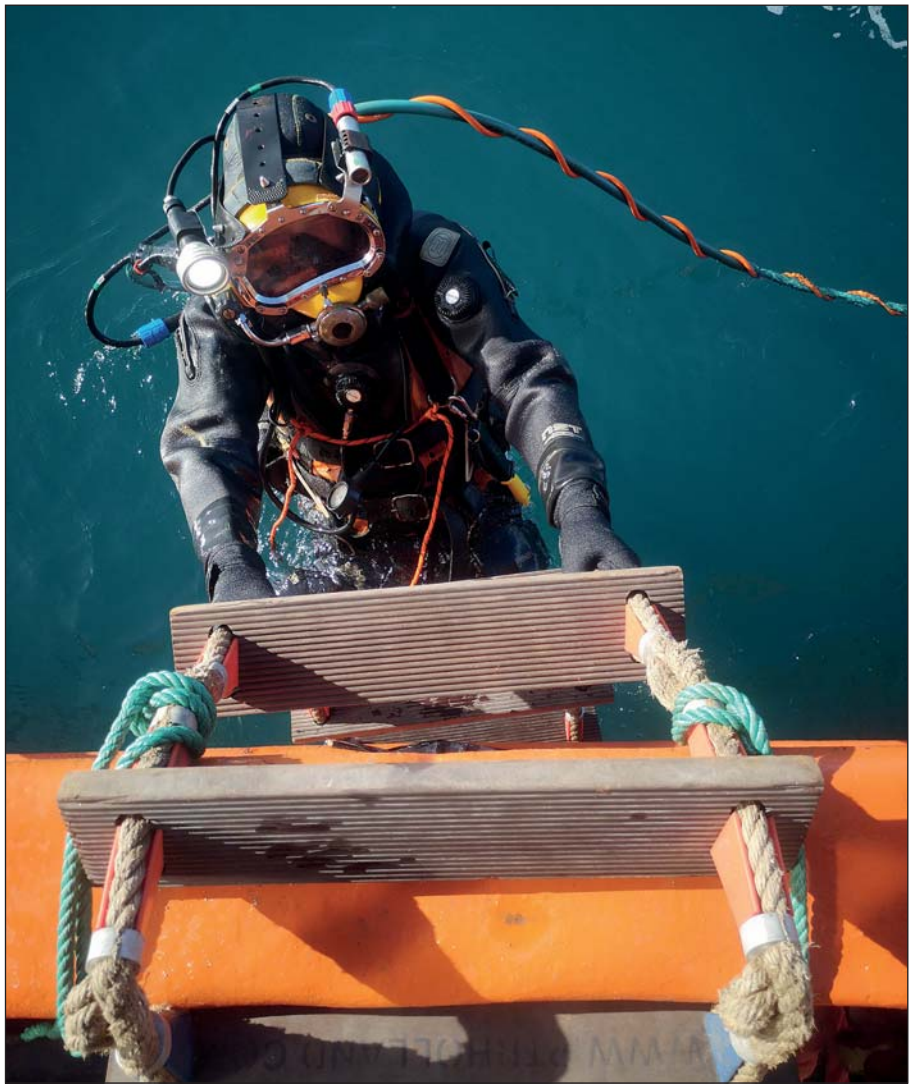
Scrubber overboard pipe repairs in Europe

Recently our diver/technicians carried out scrubber overboard pipe repairs in Belgium, France, the Netherlands and Spain. The corroded areas of two scrubber pipes were ground out and rewelded on a 200-meter roro vessel. On a 400-meter container ship six pipes were replaced. In all cases the pipes were protected with Ecospeed, a highly chemically resistant coating produced by Subsea Industries.

Exhaust scrubbers are systems that filter out all harmful toxins from exhaust gasses of marine diesel engines. These can severely corrode the pipes of the scrubber which can result in water ingress if not handled quickly enough.

Fast mobilization

A team traveled to the roro vessel's location with one of our workboats. After arriving at the ship they first performed an inspection of the



Hydrex diver/technician after underwater operation.

Corroded flange weld seam of overboard pipe on 200-meter ship.

To prevent the pipe from corroding again, the inside was coated with Ecospeed.

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.

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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Construction of new scrubber pipe at Hydrex warehouse in Antwerp.

Preparing one of the damaged overboard pipes for removal.

Nightshift during scrubber pipe repair in Algeciras.

Preparing one of the new pipes for installation.

damaged areas on both the waterside and the onboard side of the hull.

As the corrosion on the scrubber overboard pipes of this ship was not yet severe, a full replacement of the pipes was not needed.

Our diver/welders then sealed off the outlets of both overboard pipes. This allowed them to perform work inside the engine room without water ingress.

The team ground away the affected area before rebuilding it back to its original thickness.

When the welding was complete the surface was cleaned and an MPI was carried out by an independent inspector.

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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Hydrex team leader monitoring the operation.

The inside of the pipes was then coated with Ecospeed to keep them safe from further corrosion.

This product is produced by Hydrex sister company Subsea Industries (www.subind.net). Ecospeed is highly chemically resistant. Taking into account the nature of the process taking place inside a scrubber, this is essential for a lasting protection of the pipe. Ecospeed can also be used to protect a newly installed scrubber system from day one.

Adapting to the customer's schedule

Several factors made the operation on the container vessel more complex.

A total of six pipes were damaged. It was essential that the ship could keep its schedule during the repair. For this reason we split up the operation in several stages. These were carried out in different ports to fit the customer's need. Over 45 years of experience allowed us to arrange this without causing any hindrance for the customer.

The pipes needed to be replaced completely. They were therefore constructed at our warehouse in Antwerp. Our divers are certified wet and dry welders as well as technicians. This allowed us to offer the full repair from start to finish.

Because of the location of the damaged parts of the pipes welding work on the inside shell plating of the hull needed to be performed. As a result the outside of the overboards could not be sealed off with a simple patch. For this reason six custom cofferdams were also designed and constructed at our workshop based on the drawings sent by the customer.

Our team installed the cofferdams over the outlets of the pipes. This allowed our welders to safely work on the shell plating of the vessel.

All six pipes were then removed and replaced with new ones. They were positioned and secured with a full penetration weld. Next an independent inspector carried out NDT testing of the weld seams.

Conclusion

The repairs in Antwerp and Rotterdam were done with our repair support workboats. They are fully

Our workboats enable a swift mobilization throughout ports in Belgium and the Netherlands.

equipped with hydraulic cranes, winches, a dive spread, control room and repair tools. Having them stationed at these locations is a big asset. It allows us to be at a ship's location in the shortest time without delaying ongoing operations.

We offer a full package to owners that are experiencing similar damage. We replace the corroded exhaust pipe while your vessel stays on schedule and we make sure that you will not have to call us again in a few months' time for the same problem. ■

Contact us to find out how we can assist you. We are available 24/7.

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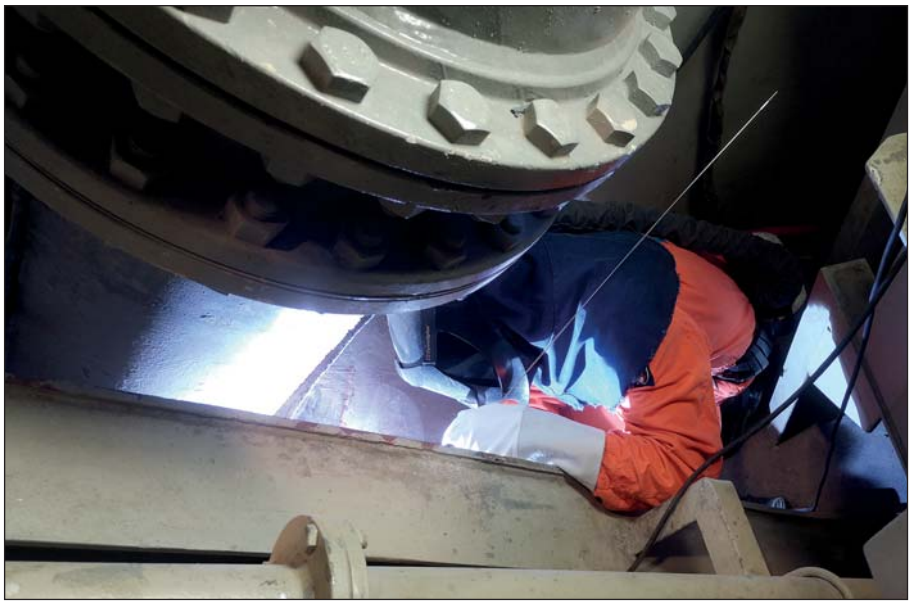

Welding one of the new scrubber pipes.

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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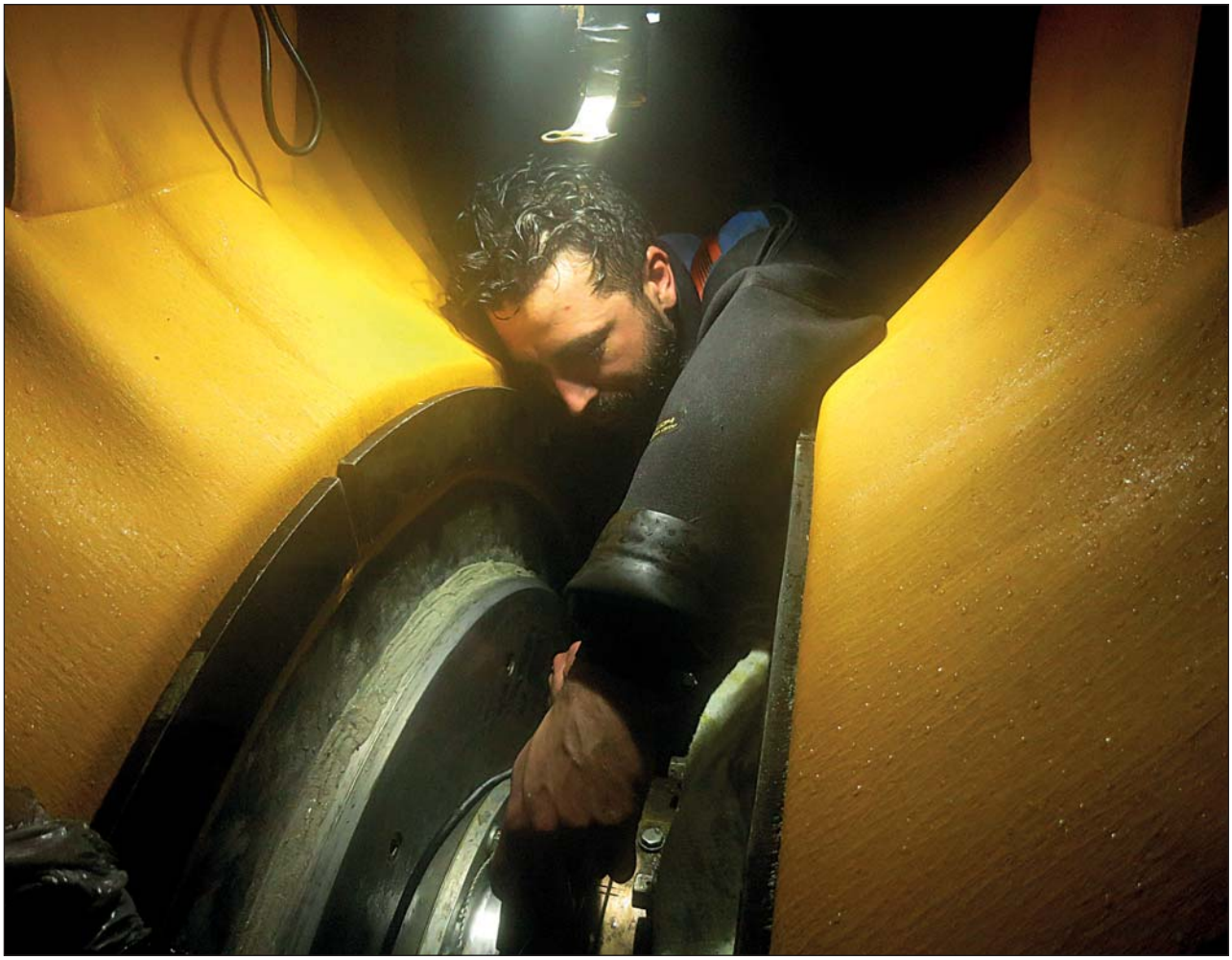
Stern tube seal repairs



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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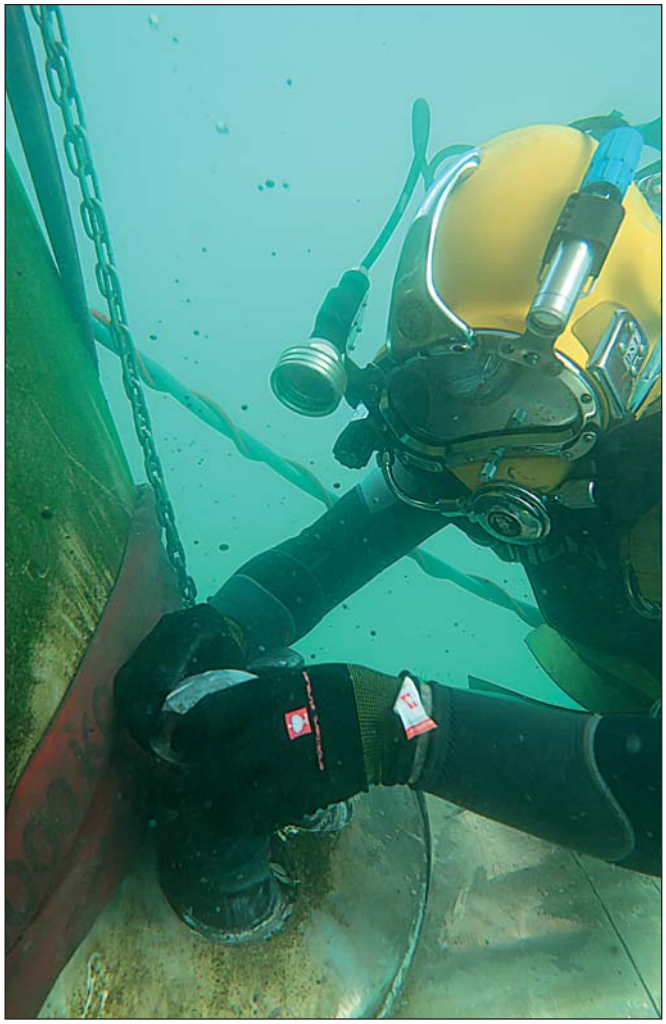
Emergency underwater blade seal replacement

Oil was leaking from a propeller blade of a general cargo ship. The vessel could not use its propeller anymore and the blade seal needed to be replaced. Time was critical and a fast and on-site solution was essential in keeping the ship on schedule. We therefore mobilized a team to the ship's location in São Vincente, Cape Verde to perform emergency repairs.

Hydrex diver/technician during removal of propeller blade.

Our men started the repair with the installation of chain blocks to rig the blade. They then removed the blade bolts and lifted the blade. The damaged blade seal was replaced



Removing the propeller blade bolts.

Lifting the propeller blade.

Secured bolts after reinstallation of propeller blade.

with a new one. After the new seal was installed the blade was repositioned and the bolts were secured again.

A successful oil pressure test and an underwater inspection of the entire propeller were performed, concluding the repair. With the oil leak repaired the vessel was able to leave Cape Verde with a working propeller. The owner could keep to the sailing schedule without any delay.

Propeller blade removal and reinstallation

Removing a propeller blade allows our teams to perform work on the propeller while the vessel stays afloat, but sometimes one or more blades need to be replaced or overhauled. We can remove them and replace them or reinstall them when they return from the workshop.

A good example was the operation on a roro ship berthed in Tasmania. This operation consisted of the underwater replacement of the damaged blade as well as the opposite blade of the main propeller of the vessel.

This propeller was designed with a special system to close it off from water ingress during a blade replacement. The operation was performed under supervision of an engineer of the propeller's OEM.

Once the first blade had been lifted, a spare blade was lowered into the water and put in position. After it was secured and the bolts put on torque, the ship crew turned the propeller 180° to bring the opposite blade in 12 o'clock position. The diver/technicians then repeated the same procedure on this blade.

The operation was finished swiftly to enable the owner to sail his ship on schedule. No costly drydock visit had to be planned. ■

Contact us for more information on propeller repairs or any other underwater operation. We are at 24/7 call.

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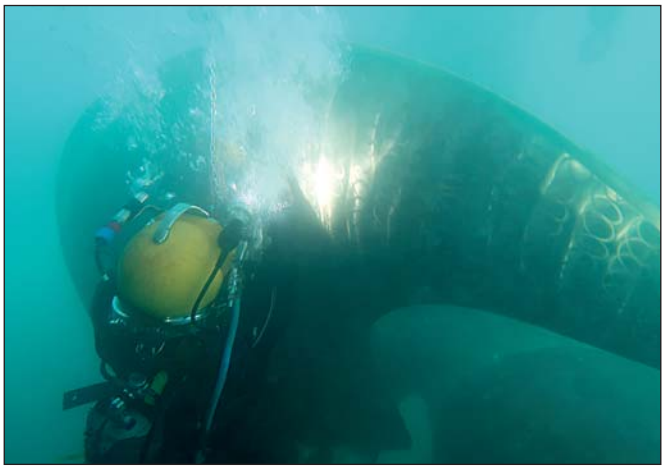
Damaged propeller blade lifted on the dock.



One of our divers guiding the new blade during installation.

The blade had suffered a very deep crack and needed to be replaced as per OEM recommendation.

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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Sail safe with Hydrex

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

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