HYDREX®
UNDERWATER TECHNOLOGY

NEWS
LETTER | 294

Contents

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.

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Several repairs performed simultaneously in Flushing

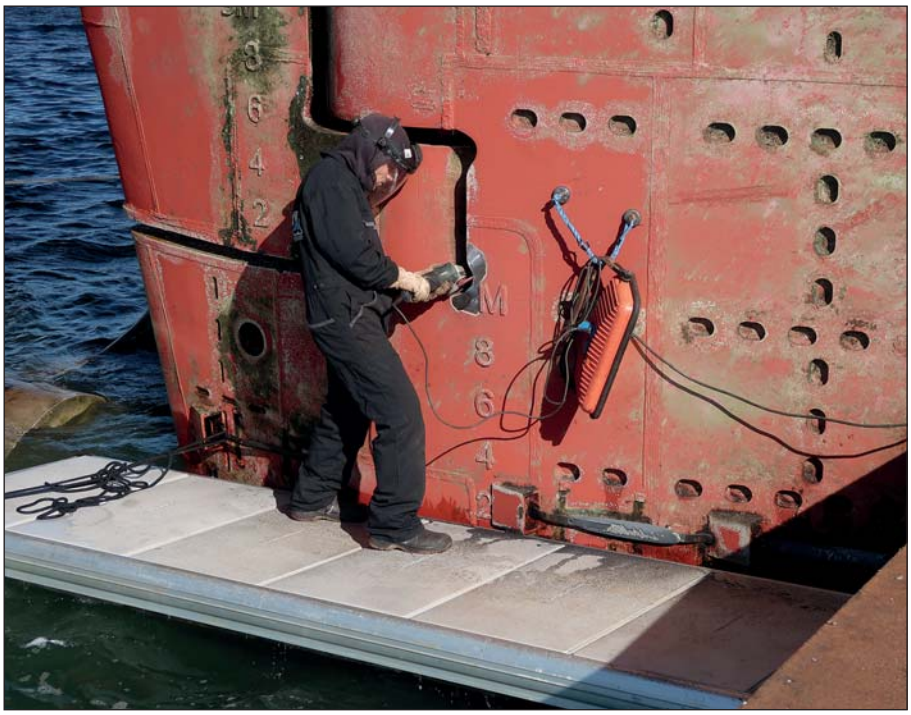
Last month our diver/technician teams carried out several repairs during one operation on a 165-meter tanker. Work on the rudder, bilge keels and bow thruster grids was performed simultaneously during the ship's stop in Flushing, the Netherlands.

By combining these repairs into one operation we brought the needed time frame down to the absolute minimum. This allowed the owner to sail his vessel on schedule to the next stop. It is a good example of the flexibility of services we offer our customers. We adapt our work to your schedule and can easily adjust to changing circumstances.

One of the cracks in the pintle corners of the rudder.

We can also split up a repair in several stages that can be carried out in the same port during consequent visits or in different ports. This might be needed if a repair is too complex to perform during one stop or if a ship only has a very short window, as is the case with cruise ships or ferries that only make a short stopover in each port.

Our divers are trained to be flexible and to adjust to the specific circumstances of an operation.



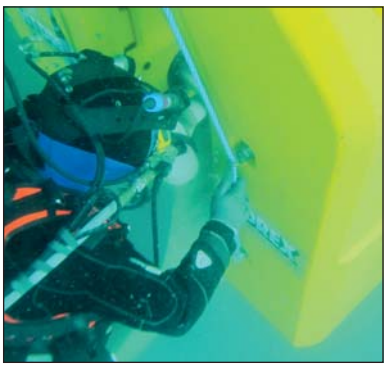
Grinding out the cracks.

Rudder cracks and thruster grid bolts

Our workboats are ready for immediate deployment throughout ports in Belgium and the Netherlands. This allowed us to mobilize very quickly to the ship's location in Flushing.

Upon arrival our men split up in two teams. One team performed an underwater inspection of the bow thruster while the other technicians started working on the rudder. A pre-

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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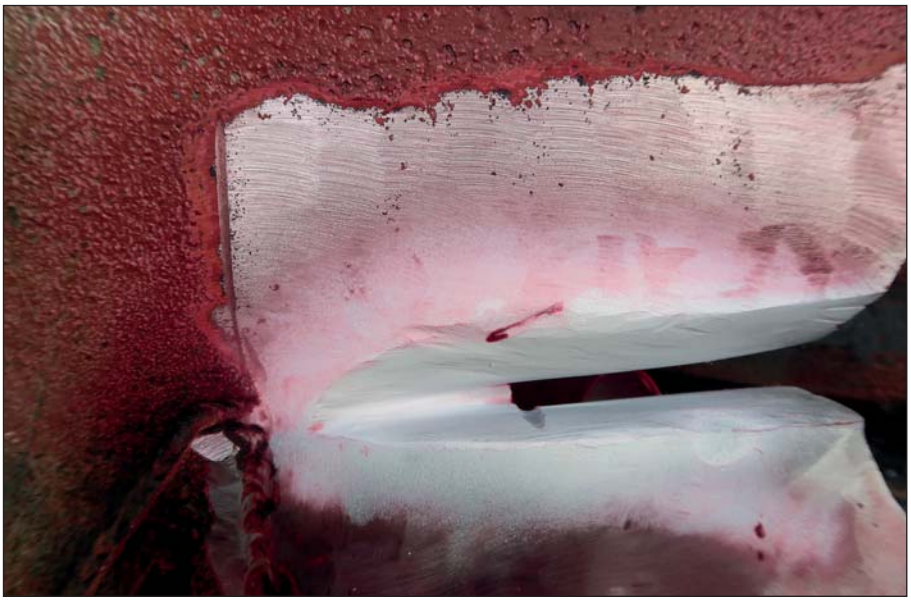


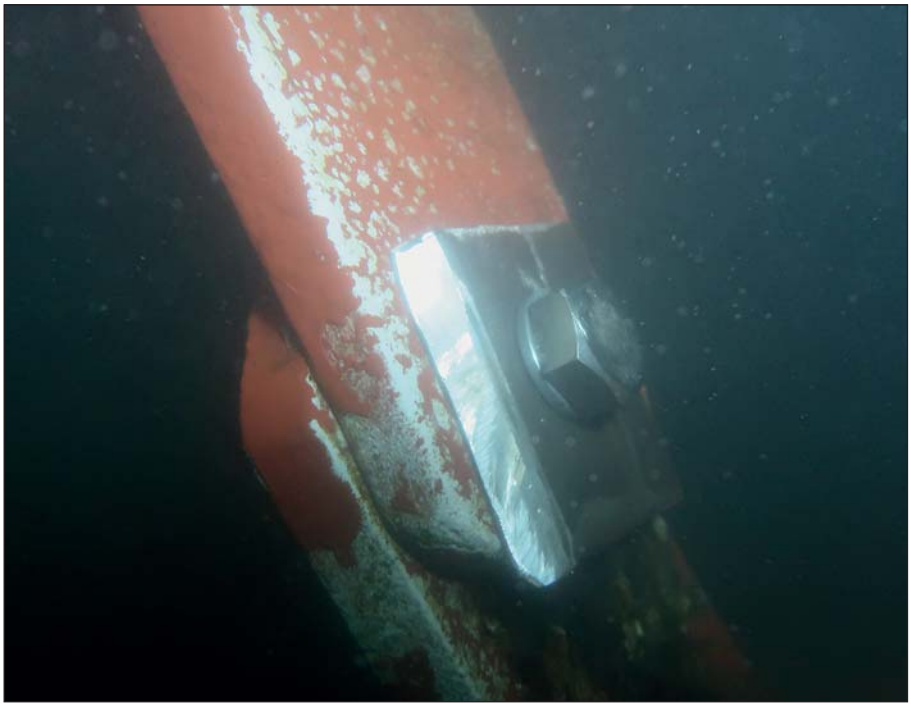
Ground out crack ready for rewelding.

Our men working on both sides of the rudder at the same time.

Rewelded crack.

One of our divers reinstalling thruster tunnel grid bolts.

vious inspection had revealed cracks on the rudder's lower pintle area. The vessel could be trimmed enough to bring the damaged area of the rudder above water. This allowed us to access the cracks using a pontoon.



One of the secured grid bolts.

The team worked on both sides of the rudder at the same time, following the same procedure. First they used a dye penetrant test to discover the crack ends. Crack arrests where then drilled to prevent further spreading. Our diver/technicians ground out the cracks over their entire length. Next they were filled with our class approved full penetration welding.

To finalize the repair the corners of the lower pintle were re-shaped with a larger radius, as was advised by the attending class.

Meanwhile two thruster grid bolts were found missing during the inspection of the thruster tunnel. Ten

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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The bilge keels on both sides of the tanker had suffered several large cracks.

One of our divers getting ready for underwater operation.

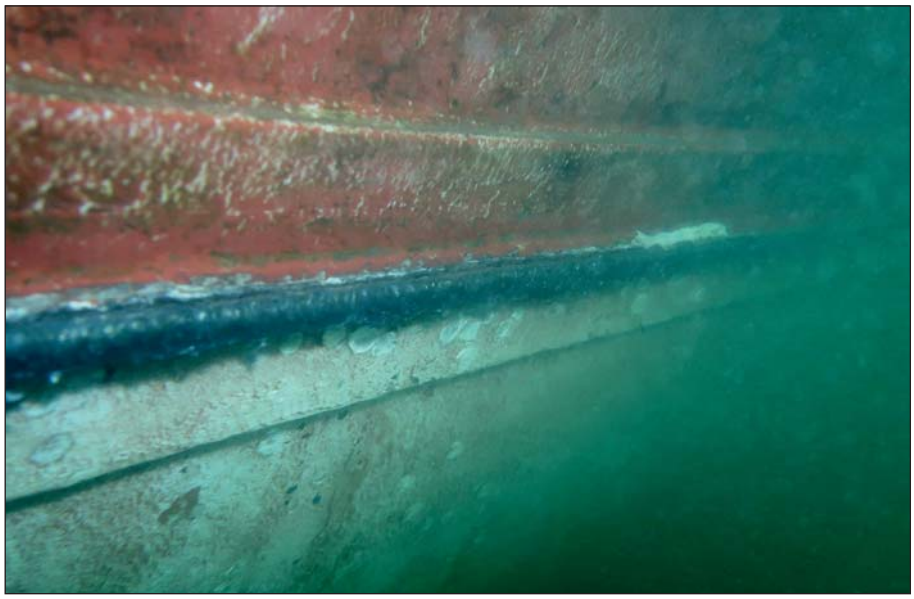
other bolts had come loose. Our diver/technicians reinstalled the missing bolts and secured the other ones.

Bilge keel cropping

After reinstalling the bolts this team started the last part of the operation. The bilge keels on both port and starboard side of the ship had suffered several cracks. A total of nine sections needed to be cropped or removed underwater by our diver/technicians.

On starboard side three sections were cropped over a length of 2600 mm while one section was removed completely. On port side four sections needed to be cropped over a length between 2100 mm and 2600 mm. One section was removed completely.

In total nine sections of the bilge keels were cropped.



One of the damaged bilge keel sections after cropping.

Conclusion

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.

Our diver/technicians split up in two teams working simultaneously to shorten the time frame 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 without a costly and time-consuming trip to drydock. ■

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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Scrubber overboard pipe repairs in the Netherlands

We were asked to assist with the three corroded scrubber overboard pipes of a 292-meter bulker. The ship was not allowed to sail to drydock without a repair. We immediately sent a team to the bulker's location in Ijmuiden, the Netherlands for a temporary solution.

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. For this reason the classification society requires regular thickness measurements to be performed.

The latest inspection had revealed that the three pipes were heavily corroded and needed to be repaired. The ship was sailing to drydock where the pipes would be replaced, so a fast temporary solution was required.

Fast mobilization

A team traveled to the bulker's location in Ijmuiden. After arriving at the ship they first performed an inspection of the damaged areas on both the waterside and the onboard side of the hull.

Our diver/welders then sealed off the outlets of the overboard pipes with custom cofferdams designed and constructed at our workshop. This allowed for work inside the engine room without water ingress.

Corroded scrubber pipes on bulker.

The affected area was ground out.

One of our technicians working on scrubber overboard pipe.

Working on two pipes simultaneously.

The team ground away the affected area before rebuilding it back to its original thickness. To give extra protection during the trip to drydock our men installed reinforcement shells around the pipes.

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

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

Reinforcement shell around overboard pipe.

Hydrex welder installing reinforcement shell.

Inside of pipe coated with Ecospeed to prevent further corrosion.

This product is produced by Hydrex sister company Subsea Industries (www.subind.net) and is highly chemically resistant. Ecospeed will also be used to coat the replacement pipes before they are installed in drydock. This will make sure that the owner will not have to call us again for the same problem.

Preventive maintenance

In this case a drydock visit had already been planned and a temporary repair was needed, but our teams can also replace a corroded exhaust pipe. This is a permanent repair that can be done while your vessel stays afloat.

If a pipe is already starting to corrode a leak is just a matter of time. You do not have to wait until it is fully corroded, we can also replace pipes preemptively. By performing the replacement before the leak occurs, our divers prevent a costly unscheduled repair later.

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

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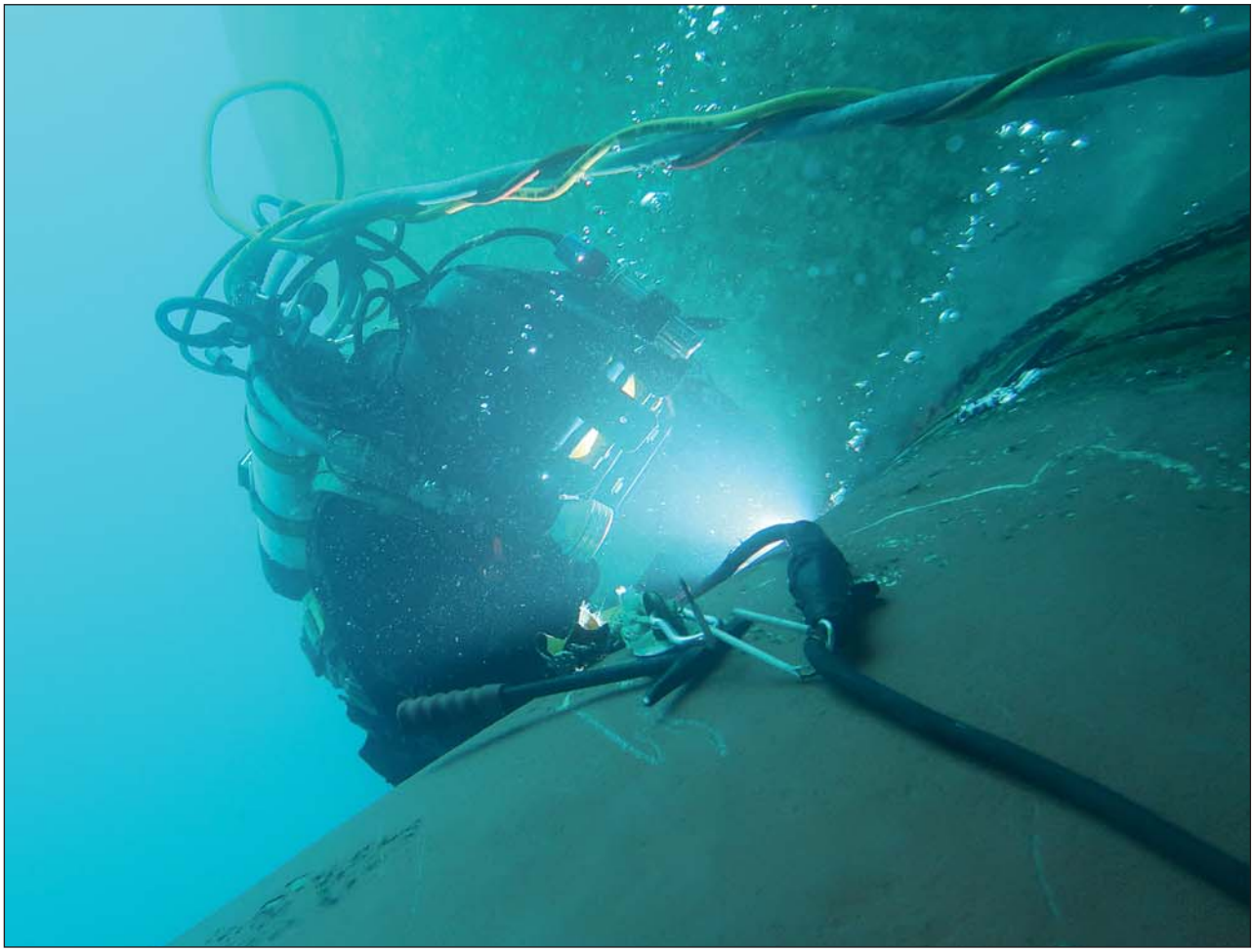
Stern tube seal repairs



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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