HYDREX®

UNDERWATER TECHNOLOGY

NEWS

LETTER | 316

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In-water bow thruster operations

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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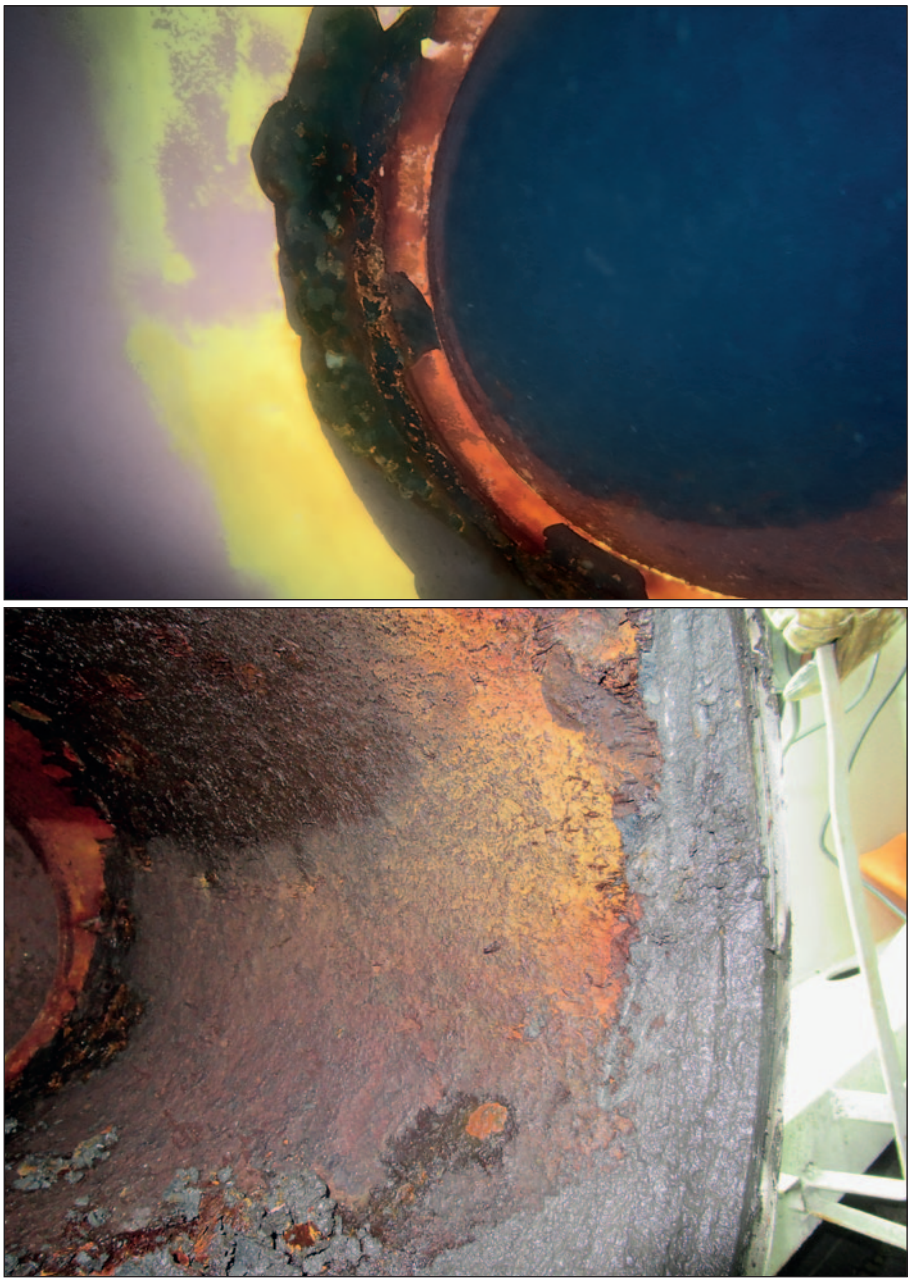
Scrubber overboard pipe operations on sister vessels in Denmark

Recently our diver/technicians carried out scrubber overboard pipe repairs on two ships in Munkebo, Denmark. In total seven corroded pipes were repaired. On five pipes the corroded areas of the scrubber pipes were ground out and rewelded. The pipes were then protected with Ecospeed, a chemically resistant coating produced by Subsea Industries. The same protection was given to the two new pipes that were installed.



Corroded scrubber pipe seen from the waterside and the onboard side.

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

Replacement and repairs

A 295-meter LNG carrier needed maintenance and repair work carried out at the Fayard shipyard in Munkebo, Denmark. We were asked to perform repairs on three scrubber overboard pipes while the ship was berthed at the yard.

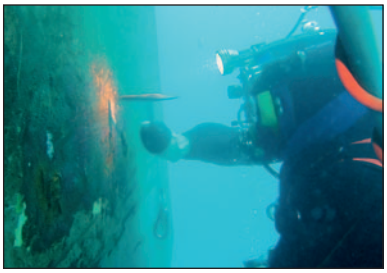
One of our teams traveled to the vessel's location. After arriving at the ship on one of yard's workboats they first performed an inspection of the damaged areas on both the waterside and the onboard side of the hull.

This revealed that two of the pipes needed to be completely replaced. As the corrosion on the third scrubber overboard pipe was not yet severe, a full replacement was not needed.

Because of the location of the damaged parts of the pipes, welding work on the inside shell plating of the hull was needed. As a result, the outside of the overboards could not be sealed off with a simple patch. Custom cofferdams were designed and constructed at our workshop.

After the installation of the cofferdams, the team cut away the old pipes. The shell plating was then prepared for the installation of the replacement part. New pipes had also been constructed at our workshop in

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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One of our men preparing the edge for installation of new pipe.

New pipe fitted and ready for welding.

All welding work is done following our class approved procedures.

Hydrex welder working on the frame next to the new pipe.

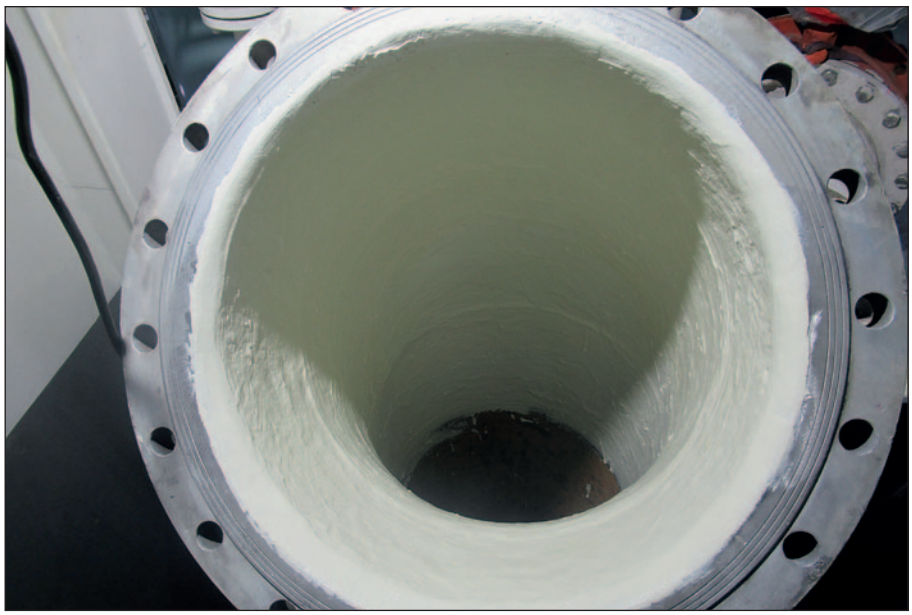
Antwerp. The pipes were then positioned and secured with a full penetration weld. Next an independent inspector carried out NDT testing of the welding work.

Our diver/welders then sealed off the outlet of the final overboard pipe. The team ground away the corroded area before rebuilding it back to its original thickness.

When the welding was complete the surface was cleaned and a Magnetic Particle Inspection (MPI) was carried out by an independent inspector.

Lasting corrosion protection

To prevent both the new and the repaired pipes from corroding, the inside was coated with Ecospeed. This product is produced by Hydrex's sister company Subsea Industries. Ecospeed is highly chemically resistant. Considering the nature of the process taking place inside a scrubber, this is essential for lasting protection of the pipe. Ecospeed should also be used to protect a newly installed scrubber system from day one.



The inside of new/repaired pipes is protected with a unique corrosion resistant coating.

Independent inspector checking the welds.

The affected area of the less severely corroded pipes was ground out.

A month later the LNG ship's sister vessel came to the yard and we were once again asked to perform an inspection and any needed repair of the scrubber overboard pipes.

Luckily the corrosion on the scrubber overboard pipes of this vessel was less severe. A full replacement of the four pipes was not needed.

Our diver/welders repaired the pipes using the same procedure as on the first ship. The inside of these pipes was also coated with Ecospeed to keep them safe from further corrosion.

Conclusion

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 with the same problem.

Most ships sail on a tight schedule. We know how important it is to prevent any loss of time. Our technical department has many years of experience in drawing up a repair plan that fits in perfectly with a vessel's schedule. Working in shifts or splitting up an operation in stages are just a few of the many ways we can make sure that the impact of the repair is limited to the absolute minimum. ■

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

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Hydrex certified welder carrying out a full penetration weld on a scrubber pipe.

Inwater propeller repairs

When damage to propellers occurs due to impact with ice and other debris we can help you, even if the damage is quite extensive. Our teams can restore the propeller's balance and efficiency.

By taking advantage of the in-house developed cold straightening technique, damaged blades can be straightened underwater, allowing the ship to return to commercial operations without the need to drydock.

If straightening is not an option, the affected area of the blade will be cropped. This is done to achieve the greatest possible efficiency. Cropping is carried out using our propeller blade cutting equipment.

Our teams can also carry out any other repair work on the propeller. Examples of this are the removal and reinstallation of entire propeller blades or replacement of the propeller seal ring.

Contact us for more information on underwater propeller repairs. We are at your disposal 24/7.

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Rudder repairs in Zeebrugge, Dunkirk and Le Havre

Our teams carried out several rudder repairs on ships in Belgium and France. In all cases cracks were found that needed to be repaired to prevent them from spreading and causing further damage to the rudders.

We can perform repairs at anchorage on any type of rudder or while the vessel is berthed. In most cases this can be done without interrupting cargo operations. The following case studies give an account of some examples of this.

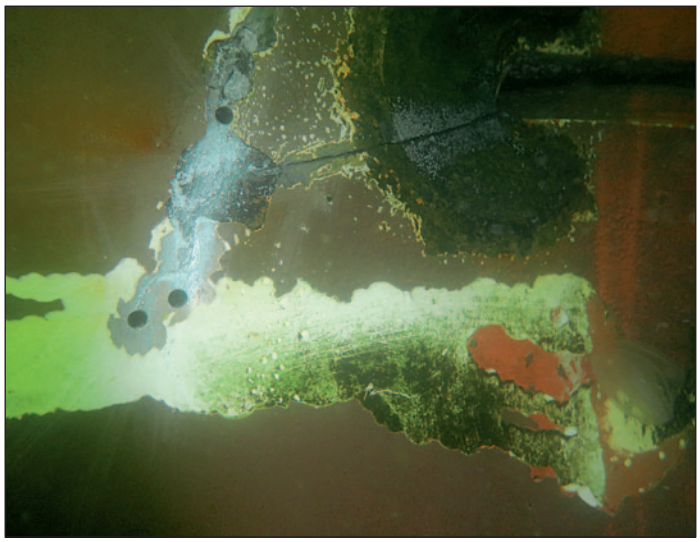
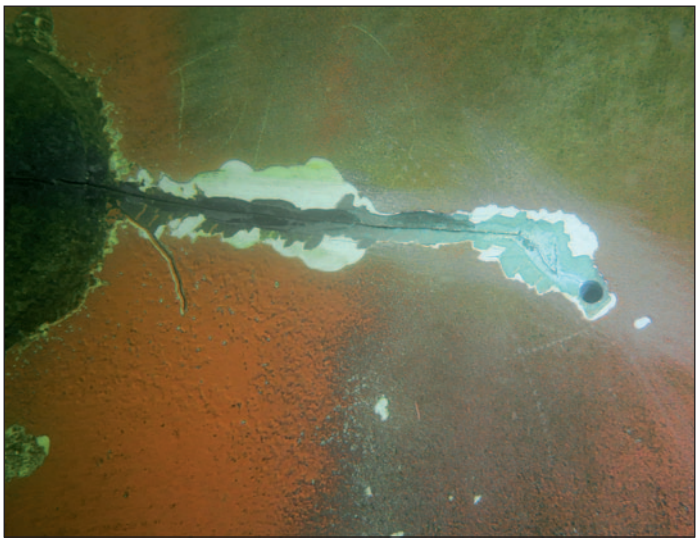
Hydrex team preparing for rudder operation in Zeebrugge.

Rudder cracks repairs above and under water

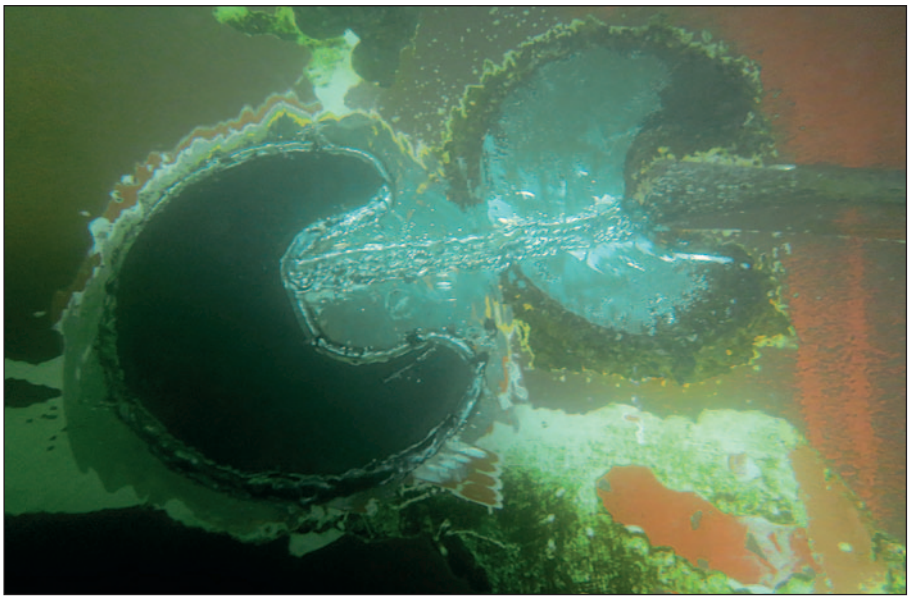
A 230-meter roro ship in Zeebrugge had suffered cracks on both sides of the rudder flap. On the starboard side a branching crack was found while a single crack was present on the port side.

Our divers first drilled arrests on all extremities of the cracks to prevent them from spreading. They then positioned C-shaped plates over the crack arrests and secured these with wet welding.


Branching crack on rudder of roro ship.

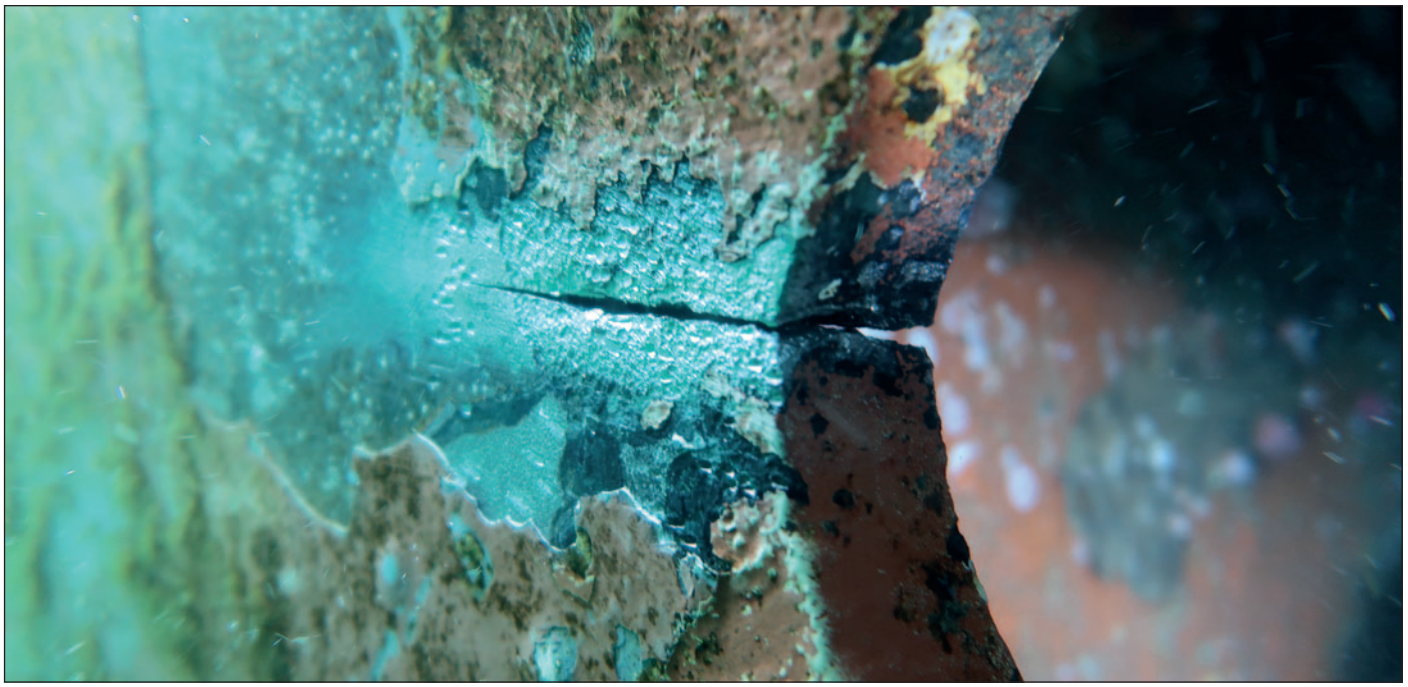
Crack arrests were drilled on the extremities of the cracks on both sides of the rudder.



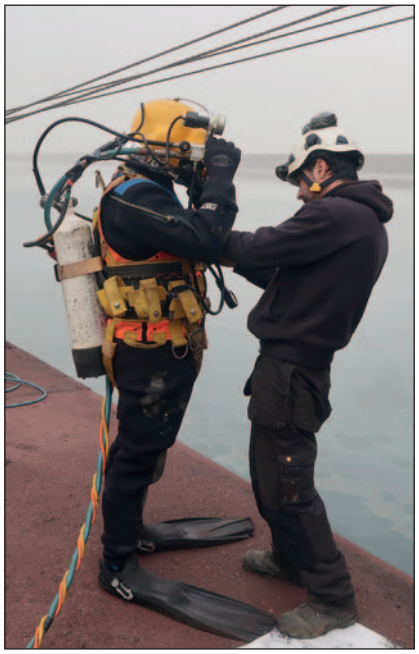
C-shaped plated welded over the crack.

This allowed the owner to sail his ship without having to worry about the condition of the rudder. He can have a permanent repair carried out during the ship's next scheduled drydock visit at a more convenient time and location.

On two 229-meter sister bulker ships in Le Havre and Dunkirk respectively, cracks were found on the upper pintle corner of the hinge that connects the rudder flap to the main rudder blade. Fortunately these cracks could be repaired by grinding them out after a crack arrest had



Crack on rudder of bulker in Le Havre.



One of our divers getting ready for underwater rudder operation in Dunkirk.

been drilled. The affected area was then filled with welding.

Timely discovery prevents more costly repairs

The cracks on these rudders were spotted during an underwater inspection before they caused problems for the ship. This once again shows the benefits of having regular inspections carried out by competent divers, followed by comprehensive and accurate reports. Our teams can detect any problem so that they can be corrected early and prevent the more costly repair which neglect and further damage would bring about. ■

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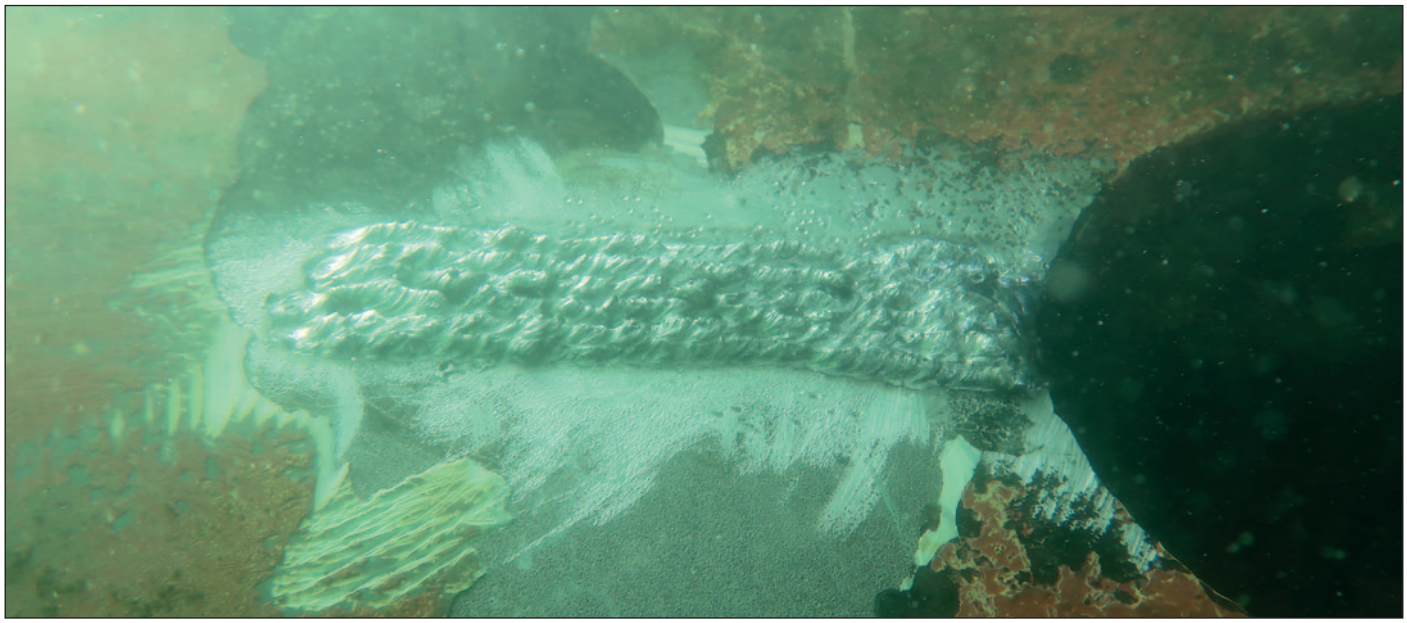
KEEPING SHIPS IN BUSINESS

Hydrex technician grinding out the crack in Le Havre on the trimmed vessel.

Ground out crack, ready to be filled.



Welding was used to fill cracks on two sister vessels after they had been ground out.

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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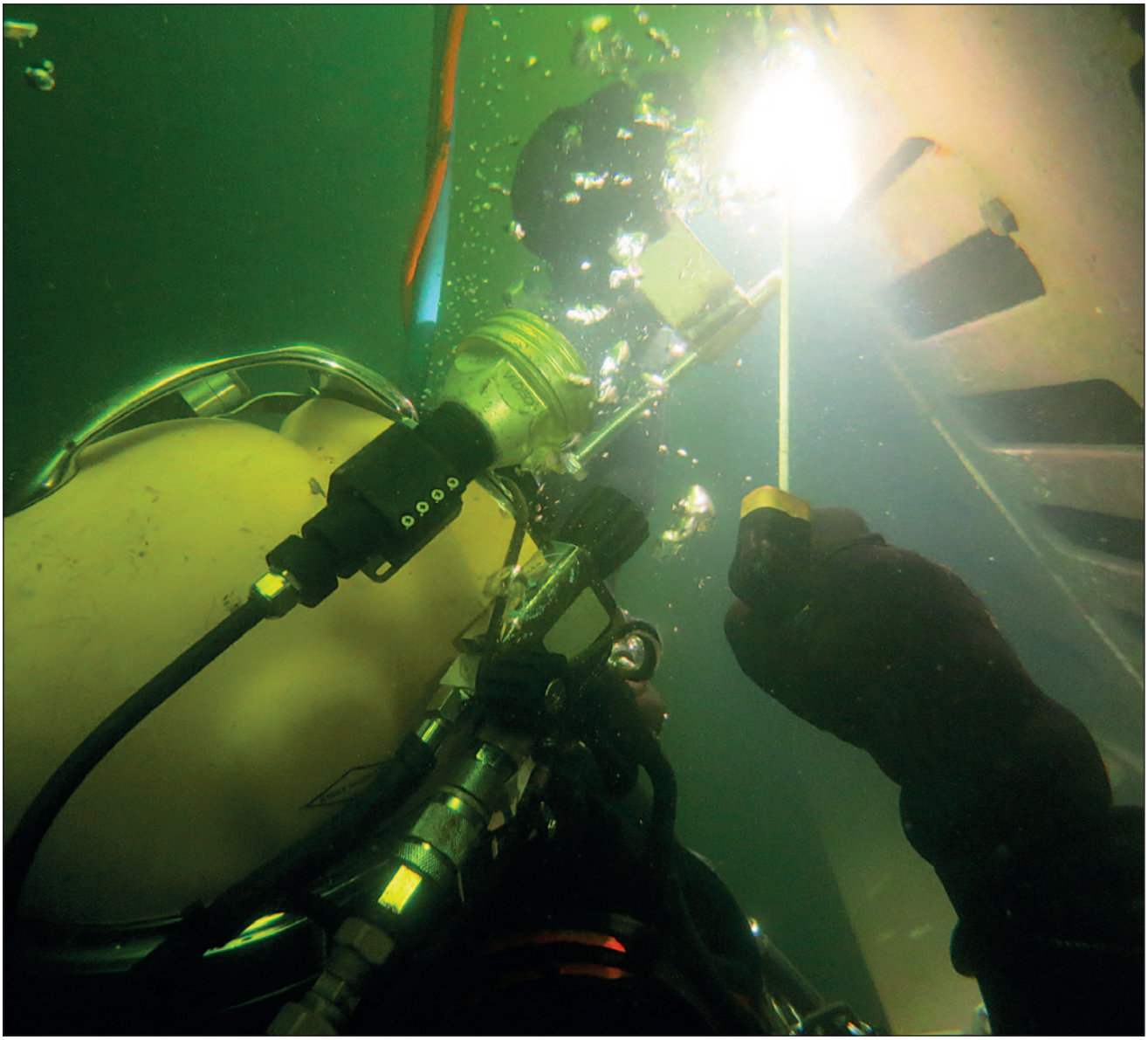

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