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Hydrex equipment and maintenance

KEEPING SHIPS IN BUSINESS

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& 45001
certified**

Underwater services and
technology approved by:



Scrubber pipe repairs and lasting protection



Exhaust scrubbers filter out all harmful toxins from exhaust gases of marine diesel engines. These hazardous pollutants can severely corrode the pipes of the scrubber. Using the experience we have accumulated over the years allows us to assist you at moment's notice if this happens.

We offer a full package to owners that are experiencing similar damage. Not only can we replace the

corroded exhaust pipe while your vessel stays on schedule, but we can make sure that you will not have to call us again in a few months time for the same problem. This is done by coating the pipes with a highly corrosion resistant coating called Ecospeed.

Contact us for more information on scrubber pipe replacements or other underwater repairs. We are at your disposal 24/7.

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HYDREX
UNDERWATER TECHNOLOGY

Several underwater repairs performed simultaneously in Cádiz

In August one of our diver/technician teams carried out several repairs during one operation on a 288-meter tanker. Work on the propeller blades, net catcher, rope cutters, split ring and rope guard was performed simultaneously during the ship's stop in Cádiz, Spain.

By combining these repairs into one operation we brought the needed time frame down to the absolute minimum. 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.

We can also split up a repair in several stages that can be carried out in the same port during repeat 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



Welding new studs on the broken bolts that could not be removed.

often 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.

Working on the seal assembly and propeller blades

The team mobilized to the tanker's location and started the operation with a detailed underwater inspection. This revealed damage on several parts of the stern underwater gear of the ship.

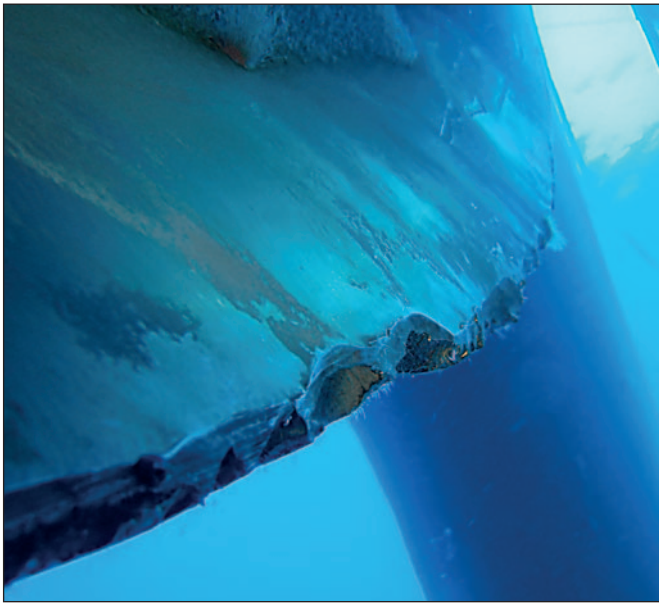
All five blades of the ship's propeller had suffered scraping marks, nicks, cracks or small bends. The team ground out the damage and smoothed the edges. This optimized the propeller's efficiency.

The propeller boss and the spinner cone were also lightly damaged, but no repair was deemed necessary on these areas.

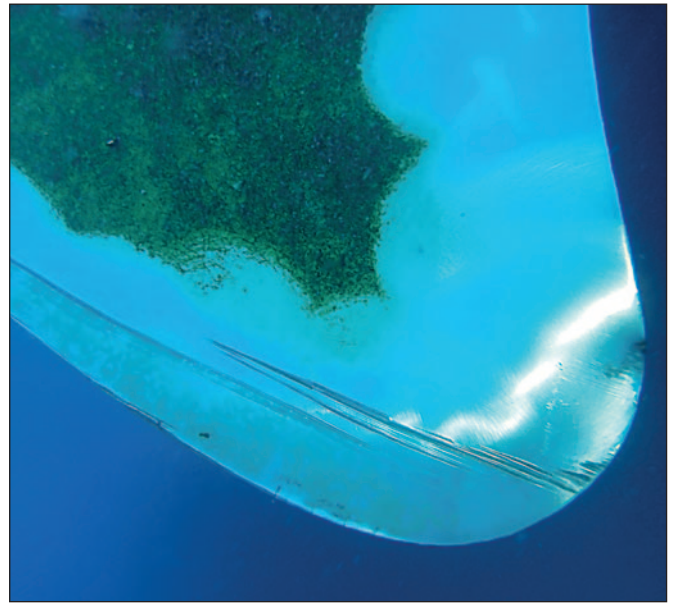


Hydrex diver getting ready for underwater operation.





One of the damaged propeller blades.



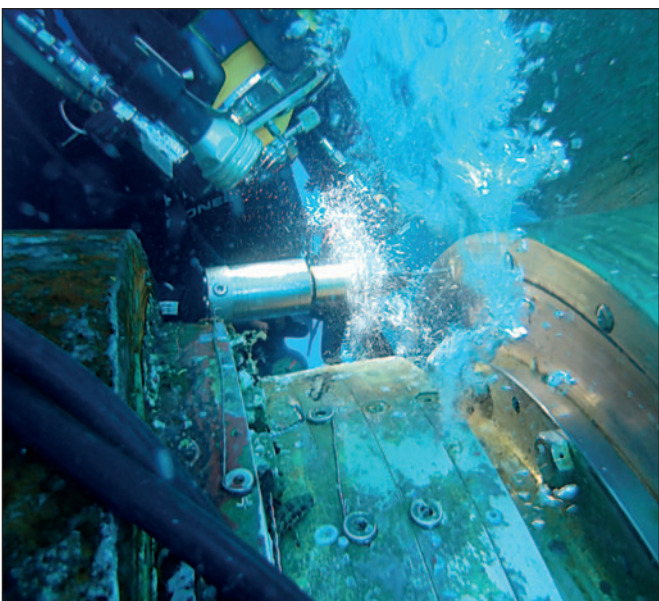
Propeller blades after all nicks had been ground out.



The port side rope guard needed to be replaced.



Old rope guard next to new one.



Removing the broken off bolts of the split ring.



New split ring installed and secured.



One of our diver/welders installing the new rope guard.

The port side stern tube seal assembly of the ship was damaged in several locations. The rope guard had been hit by some object and the bolts of the net catcher were broken. Both needed to be replaced. The split ring had also been damaged and forced out of alignment. Our divers

replaced one half of the ring, realigned it and installed new plugs.

Finally, on the starboard side, a fishing line was removed from the rope guard and three new rope cutters were installed.

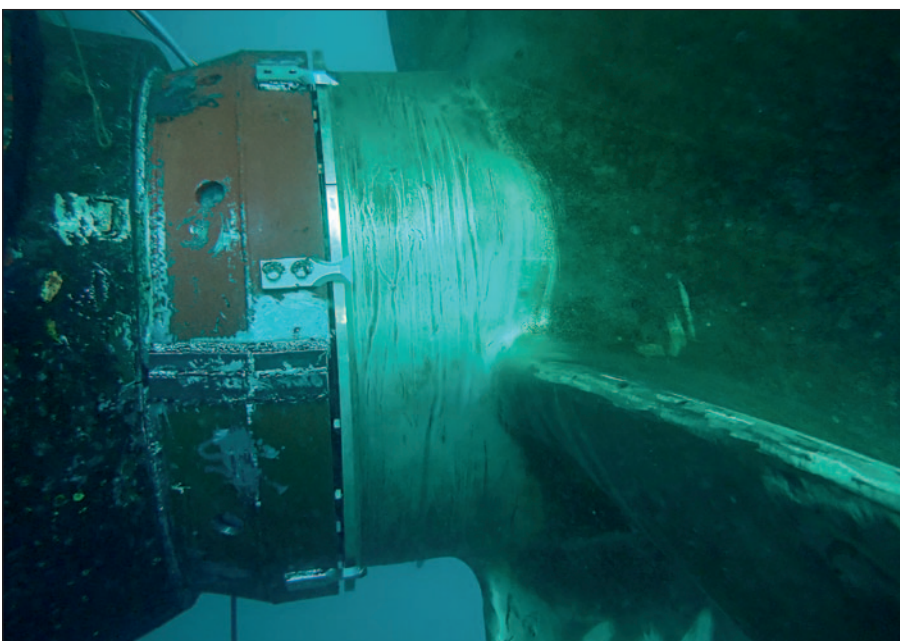
Conclusion

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 other parties involved.

The owner could continue his voyage without a costly and time-consuming trip to drydock. ■

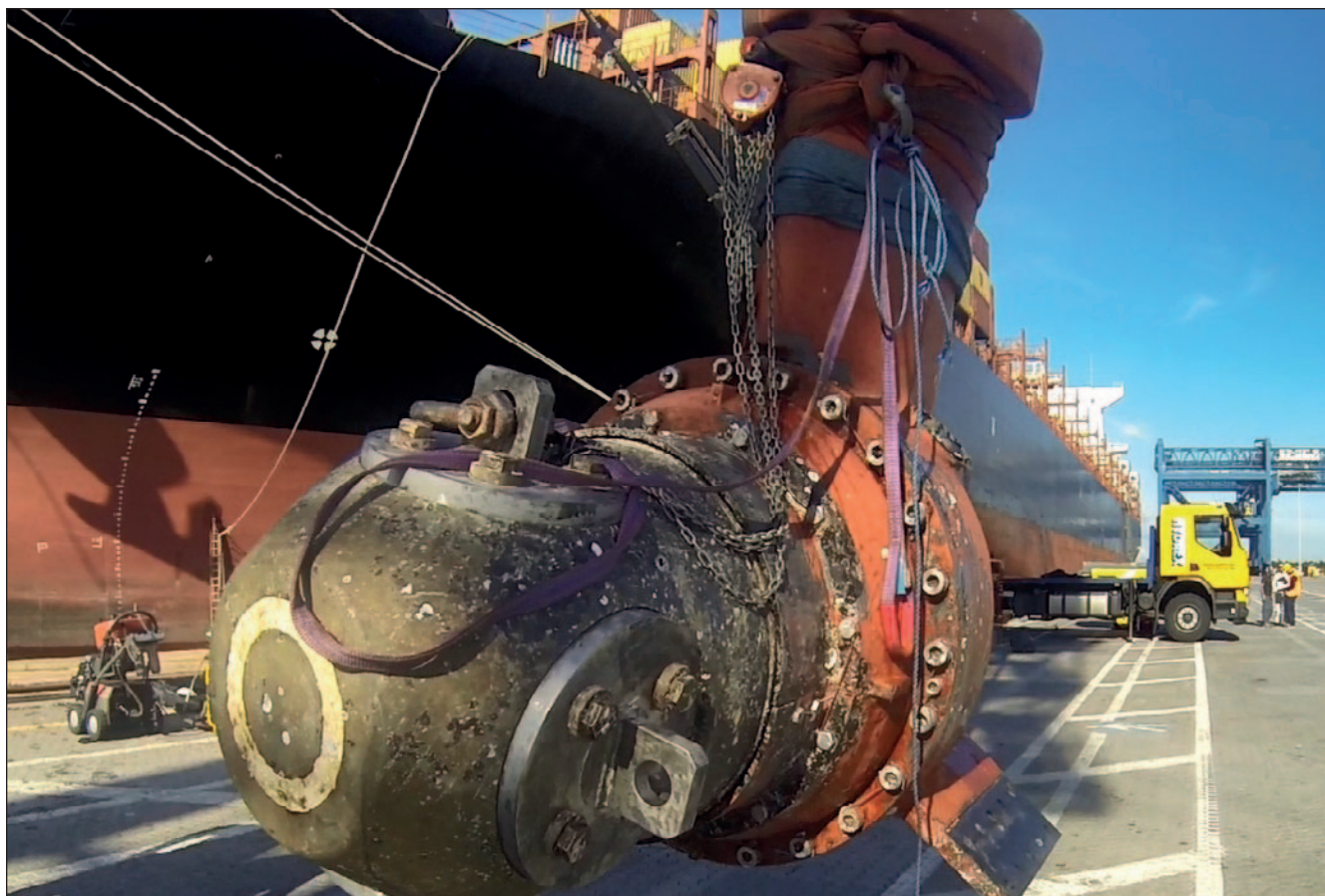
If you have any questions regarding a possible on-site repair, do not hesitate to contact us. We are at your disposal 24/7 and ready to mobilize almost immediately.

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Fully installed rope guard.

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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HYDREX
UNDERWATER TECHNOLOGY

Hydrex equipment and maintenance

A key aspect of providing rapid, high quality service

Any underwater repair or maintenance operation, no matter how complex or involved, does not begin with divers working underwater on the rudder or thruster or stern tube. The success of the operation starts in the company's depot, with the equipment, its quality, its maintenance.

No matter how willing, competent and hardworking the divers and technicians are, if they are working without the necessary equipment or with inoperational tools, the job can be delayed or fail completely. Even more important is the safety factor: when you are dealing with divers, equipment failures can mean severe injury or worse. Our policy regarding equipment has been a major contributing factor to Hydrex's safety record of 50 years without a serious incident, as well as to our reputation for high quality work.

Safety, quality, efficiency

We don't make sure we have the best equipment available and maintain it as close to 100% as possible because it's "a nice thing to have." There are three key reasons that we maintain these standards: safety, quality and efficiency (including cost-efficiency for our customers).

Safety is our first consideration in every job we do. Diving done incorrectly with poor or broken equipment can be dangerous. Done correctly with the right training, equipment and teamwork it is very safe.

Quality of work is jeopardized by missing, broken-down or poorly



Koen Smouts, in charge of equipment at Hydrex, loading a large power pack in the depot onto a truck in preparation for a job.

maintained equipment or simply the wrong equipment.

Efficiency is a very important factor when a ship is in need of repair or maintenance. Service must be delivered quickly without wasted time and effort. This is also a key factor in the overall cost of a job. It is why we can repair stern tube seals, for example, in half or a third of the time it takes another company, and at lower cost, as shown in numerous recent cases. Efficiency on the job represents a cost savings to our customers.

Poor equipment, lack of equipment, equipment that doesn't work, unsafe equipment all severely cut across each of these points.

"We never cut corners or try to save money by compromising on equipment and maintenance," says Boud Van Rompay, Hydrex founder and CEO. "It's been that way since day one."





Maintaining the equipment in top condition is a routine part of everyday life at Hydrex.

Fast response center

To ensure that we always have enough equipment and material on hand and that these are up to standard and in good order, in 2001 Hydrex built and moved into a large, clean, well-organized, fast response center on the water in Antwerp, Belgium. The facilities were expanded and modernized in 2018; the fleet of vans, trucks and workboats all updated. Today the fast response center is state-of-the-art as far as equipment and vehicles, everything in excellent condition, ready to deliver advanced underwater main-

tenance and repair services wherever they are needed in the world.

“In order to expand our worldwide reach, we are in the process of fully equipping containers of equipment which we will place strategically in ports around the world,” says Boud. “That way the equipment is on site and all we have to do is fly in our personnel, saving the customer time and costs. The containers will be identical, so the divers can walk in and find anything they need right away.”

The Hydrex approach

Boud explains, “It has been our policy since Hydrex was founded in 1974 to have excellent, well-maintained equipment. Everybody contributes to executing the policy. Koen Smouts, in charge of equipment, is maintaining it and making sure the discipline is kept in. But the discipline is demanded of everybody.”

“It has nothing to do with maintaining that ‘precious’ equipment because it cost a lot of money,” continues Boud. “The point is that it has to be maintained in working condition



Two Hydrex trucks on the road en route to a job.



Container with a dive station being loaded onto one of our workboats in preparation for a scrubber repair job in Rotterdam.



Two of the Hydrex workboats outside the rapid response center in Antwerp.



Inspection of lifting equipment by Daniel Bawin (right) of OCB, an independent testing and inspection company. Lifting gear is inspected every three months per Belgian regulations.

in order to ensure safety and maintain a high level of production. In underwater work, it's a chain, starting with the van, the truck, the workboats that bring the equipment and divers to a worksite. It goes from the purchasing to being channeled in the depot in the right places where it belongs and where it is maintained, and then it goes to the worksite. That entire chain has to be 100% or you can't do the job. It's a matter of, 'For the want of a nail the kingdom was lost.' We make sure that all the nails are in place."

In good hands

Koen is a natural fit for the job he has which is to oversee the purchasing, maintenance and repair of all the equipment. When he was very young he started helping to repair the equipment in the 142-employee family bakery and was called upon to keep the company's 43 vehicles on the road all the time so that deliveries could occur. Equipment maintenance and repair comes naturally to him. Koen has been in his current position at Hydrex for 24 years and has been responsible for maintaining the company's standards with regard to equipment. It is constant hard work with many, many different factors and logistics to deal with continually.

Koen also ensures that all the rules and regulations regarding the equipment and the facilities are complied with. This includes arranging the necessary inspections of equipment, tools and vehicles, all the way from lifting gear to workboats to practice diving tanks. It takes excellent teamwork among all Hydrex divers and technicians to keep the equipment in good working order, and the fast response center orderly so that items can be found and mobilization for jobs is rapid and efficient.



Workboat and Hydrex equipment en route to cleaning an offshore vessel in the Gulf of Mexico.



ISO 9001 and now ISO 45001

Hydrex has maintained ISO 9001 certification since 1997 which has been a key measure of the quality level of the whole organization, including the equipment. We have also always maintained or exceeded the required safety standards, but have recently upgraded to ISO 45001 certification. “Because it is an ISO standard, it works in parallel with ISO 9001,” explains Manuel Hof, who is responsible for quality and safety standards for both Hydrex and sister company, Subsea Industries. “This upgrade will give our customers even more confidence in our insistence on the highest levels of safety,” he adds. In fact it did not require many changes to obtain the ISO 45001 certification since Hydrex has maintained rigorous safety procedures from the beginning. This has always included having topnotch equipment and keeping it in excellent working order.

Who wins?

In the final analysis, excellent equipment well maintained, in the hands of knowledgeable and experienced divers and technicians, benefits everyone, but particularly the customer. The result is speedier response, a faster and higher quality underwater operation carried out more cost-effectively.

A recent case in point

Coincidentally, while this article was being written, a perfect example came up. Hydrex was asked to carry out a hull cleaning on a vessel coated with Ecospeed. The local diving company who were supposed to clean the ship were not able to achieve a good result. We sent a team of two divers armed with two power packs and cleaning machines to go and rescue the situation. The divers arrived at the ship’s location and went to work. They were able to achieve an excellent result on the ship’s hull immediately. When they



Van and trailer being loaded with equipment in the Antwerp rapid response center.

checked with the local divers to establish what the problem was, they found out that the power pack they were using was deficient and not able to deliver the necessary power required for effective cleaning. It was, in fact, the same power pack that our divers were using, but it had been dropped into the sea at some point and not properly repaired and restored. The result was a faulty power pack that could not deliver enough power to drive the brushes and effectively clean the hull. This is perhaps a minor example, but it makes the point. Due to poorly maintained equipment, the job could not be done correctly even by competent divers, and the customer was paying a higher fuel bill due to an inadequately cleaned hull. And nobody had spotted the real problem. This becomes much more serious on a major repair.

Conclusion

This policy regarding equipment has always been a key distinguishing factor of Hydrex services and a secret of our success. ■

HYDREX
UNDERWATER TECHNOLOGY

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 straight-

ened 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.

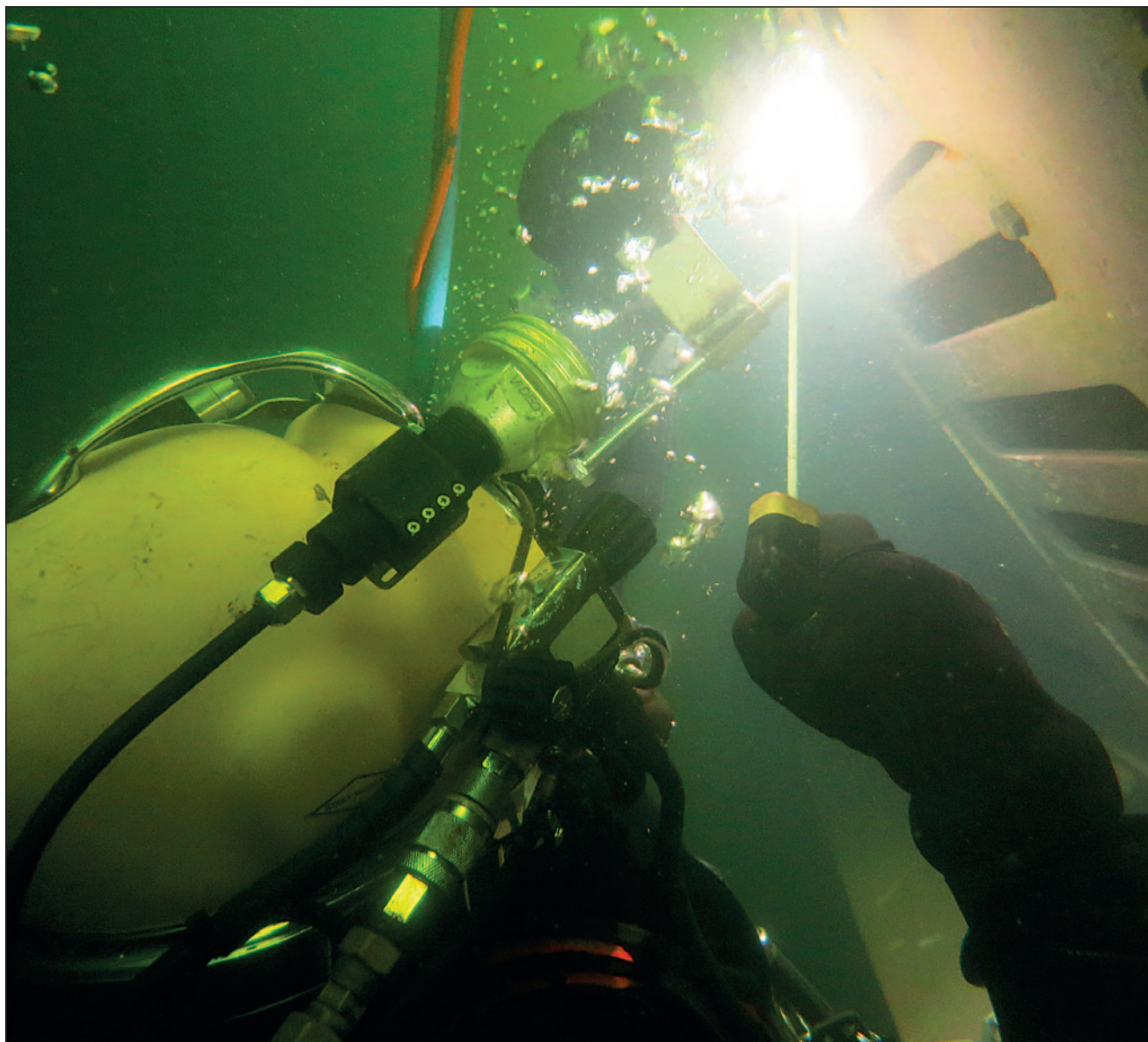
Contact us for more information on underwater propeller repairs. We are at your disposal 24/7.

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