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KEEPING SHIPS IN BUSINESS

ISO 9001 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

Underwater bow thruster repairs adapted to your schedule

Our diver/technicians can perform a wide range of repair or maintenance work on bow thrusters. An entire unit can be overhauled, propeller blades and seals can be replaced or repair work on another specific part of a thruster can be performed on-site. These repairs are performed in cooperation with all OEMs and can be carried out while the ship stays afloat, with minimum impact on its schedule.

Our goal is to offer you the most efficient solution while maintaining the highest safety and quality standards. This article gives a few examples of the many bow thruster repairs carried out by our teams.

Underwater bow thruster reinstallation in Italy

A month after we removed the bow thruster of a 300-meter container ship our men once again mobilized



Installing one of the thruster blade bolts in Italy.

to Italy. They reinstalled the overhauled unit underwater with the use of our flexible mobdock technique.

The available time window for the removal of the bow thruster had been very short because of the tight schedule of the vessel. For this reason, the job was split in parts, per-

formed in different ports.

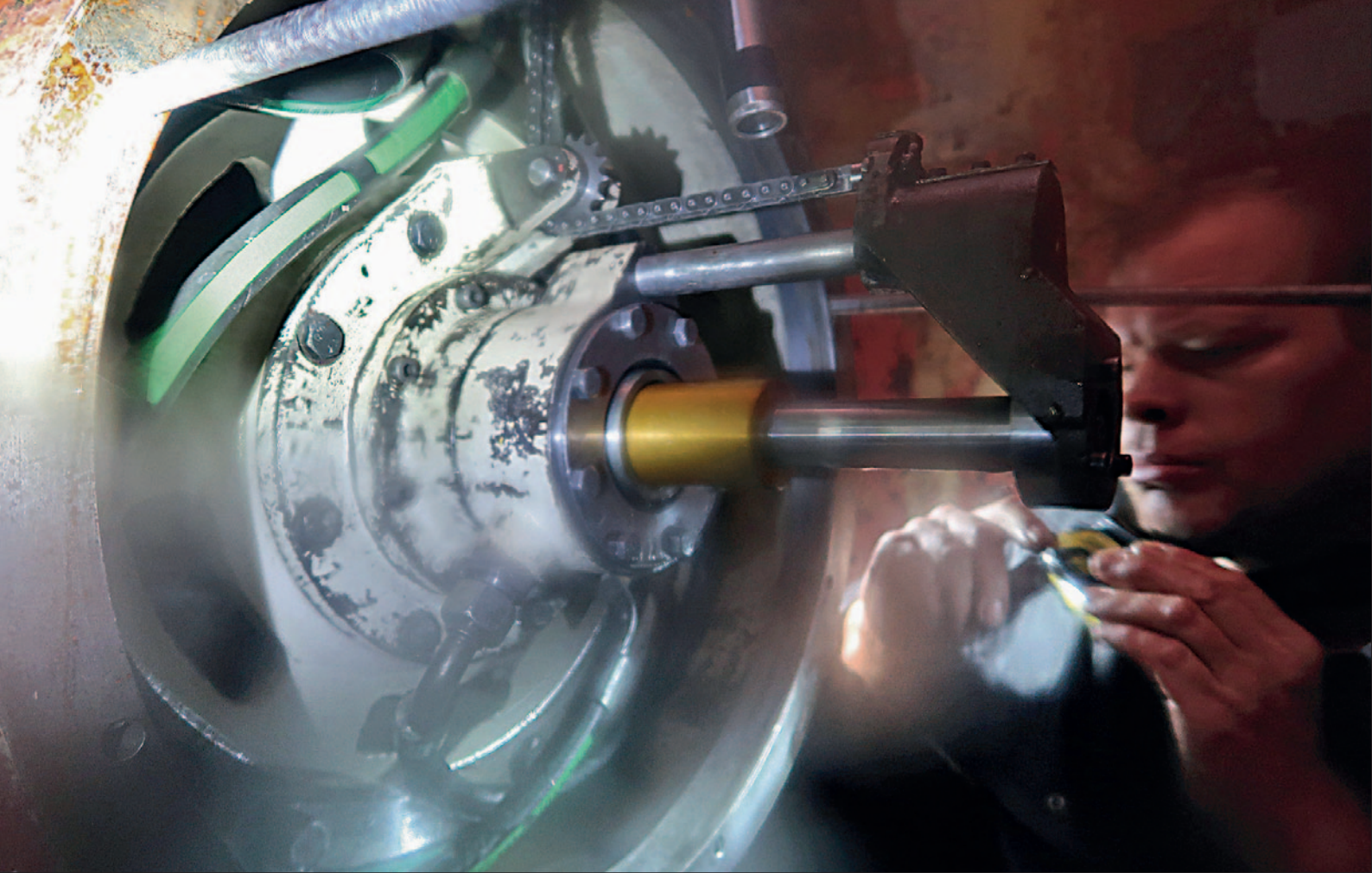
The time frame for the reinstallation was slightly larger, allowing our team to carry out the job during a single stop of the vessel. The divers maneuvered the overhauled bow thruster back into the thruster tunnel which was then closed off using our flexible mobdocks.

All water was pumped out of the tunnel. This created drydock-like conditions for our divers while the vessel stayed afloat. The team then secured the unit and connected it. Once this was done the thruster propeller blades were installed one by one. With these in position and the bow thruster tested to make sure it was functioning correctly, the ship was ready to sail.



Thruster unit being lowered into the water.





Installing the repaired part of the feedback system in Phuket.



Bow thruster being prepared for removal in Italy a month before the reinstallation.

Our teams worked in shifts around the clock to finish all tasks as fast as possible. As a result the charterer did not have to worry about his vessel's schedule.



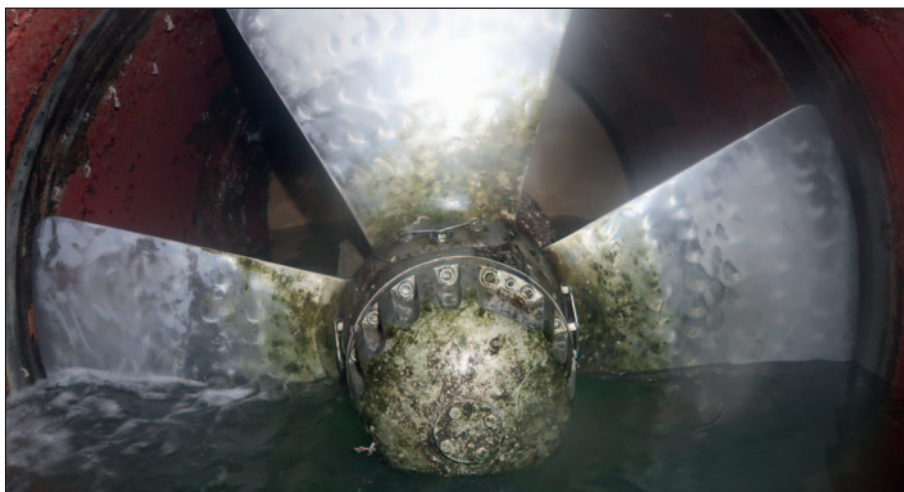
Removing the cover of the bow thruster gearbox.

Thruster repair afloat in Phuket

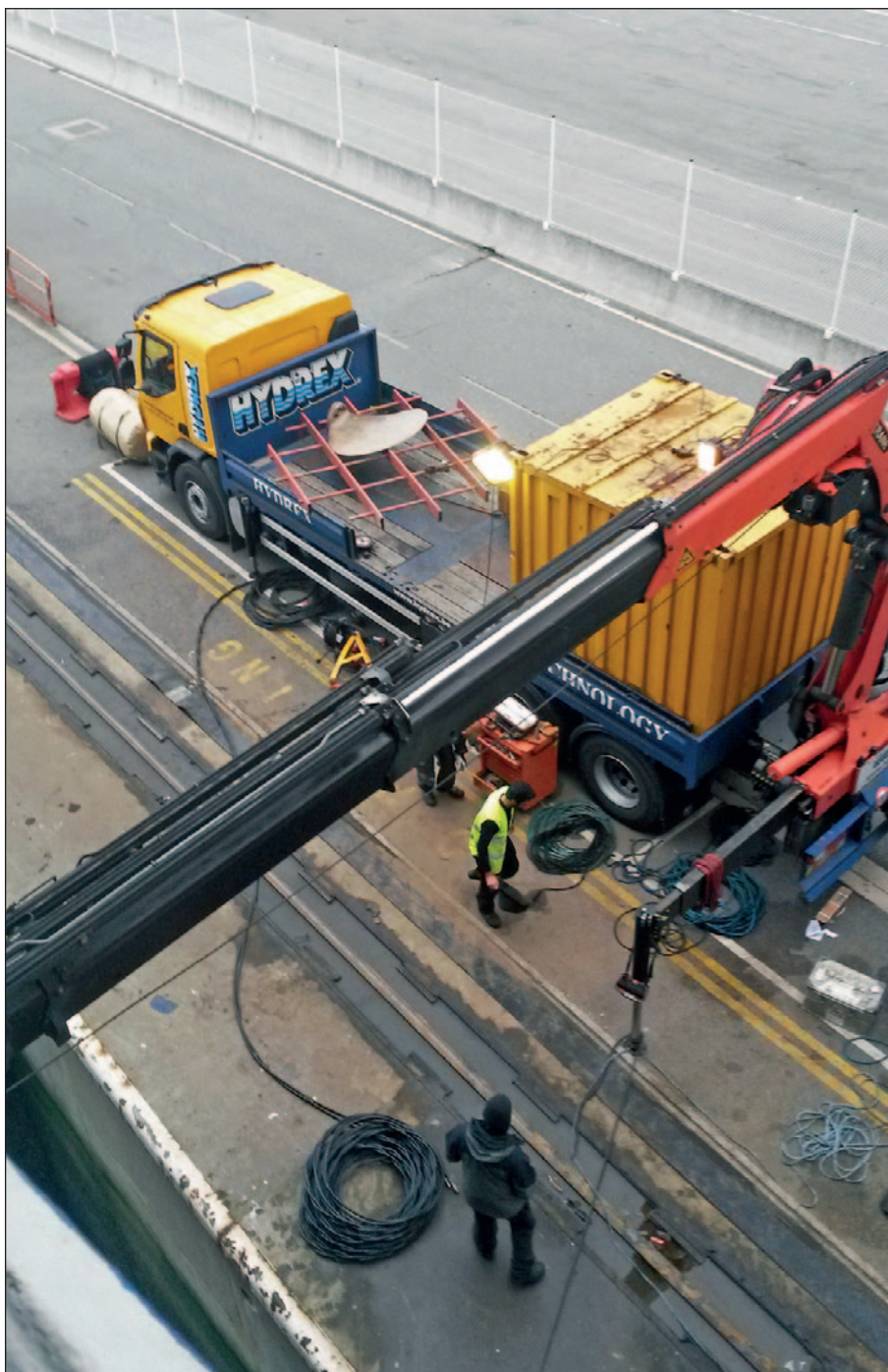
A 200-meter cruise ship experienced a problem with its bow thruster. A breakdown had occurred in the feedback system that specifies the position of the vessel's bow thruster

blades. Taking into account the strict schedule of the cruise ship, keeping it sailing was essential. We were contacted by the customer and asked to find a fast, on-site solution.

In cooperation with the manufacturer of the thruster, a plan was devised



After installing our flexible mobdocks, all water can be pumped out of the thruster tunnel.



Hydrex truck with thruster tunnel grid and thruster blade at Le Havre.

by our technical department. Our diver/technician team would carry out an inspection and any necessary repairs afloat without removing the unit from the thruster tunnel. The customer gladly accepted this proposal as it meant he did not need to take his ship into drydock.

We therefore mobilized a team to Phuket, Thailand to perform the necessary underwater repairs with the use of our flexible mobdocks.

Our team had a very cordial and smooth cooperation with the crew of the ship, the manufacturer of the thruster and all other parties involved. This helped us to perform the operation as fast as possible, thus saving the owner considerable time and money.

Underwater operation in stages avoids loss of income

A Hydrex diver/technician team removed a bow thruster unit which needed to be overhauled from a 363-meter container vessel in Rotterdam. Because of the ship's tight schedule in that port, the time required to remove the thruster unit had to be reduced to the absolute minimum.

To help economize on time, the team had already prepared the thruster tunnel during the ship's stop in Le Havre, France. This allowed the divers to perform the operation underwater in a very short time frame without interrupting the vessel's schedule.

Off-hire time causes a substantial loss of money. It was therefore very important that the ship could keep its schedule. Performing the removal in





Our diver/technician team on the way to the container vessel in Rotterdam.



The team delivered the thruster unit to the manufacturer in Rotterdam.

Bow thruster operations are carried out using our flexible mobdocks that close off the thruster tunnel on both sides. These lightweight mobdocks can quickly be transported to any location around the world.

In most cases a thruster overhaul is planned during a scheduled dry-docking. This usually means that the unit is removed in drydock. The ship

then has to wait for the repaired thruster to return and be reinstalled before the vessel can leave drydock. This means a longer drydock time and consequent cost. We can however remove the unit while the ship is still afloat so it can already be brought to the manufacturer to be overhauled. When the vessel enters drydock the overhauled unit will be ready for reinstallation without any delay.

two stages allowed this. This kind of flexibility can only be achieved successfully by staff who have familiarity with such operations and have the relevant knowledge and equipment. We have a technical department capable of executing all the required planning while our diver/technicians are trained and qualified to perform the full range of required, class-approved repair procedures in even the harshest conditions.

Information

If you have any questions regarding a possible bow thruster repair, do not hesitate to contact us.

An animation of the procedure used can be found on our website (Expertises>Underwater repairs>Thruster repairs). For more information on thruster or other underwater repairs, please contact one of our offices. We are at your disposal 24/7 and ready to mobilize almost immediately. ■

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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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**KEEPING SHIPS
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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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Ready to work throughout the port of Rotterdam

To enable a fast mobilization throughout the entire Rotterdam port without delaying a ship's commercial operations, our dive support vessels are stationed there. These workboats are fully equipped with hydraulic cranes, winches, a dive spread and control room.

This allows us to offer simple maintenance operations as well as repairs on all parts of the underwater ship propulsion system and the hull. These operations are class approved and carried out alongside or at anchorage while commercial activities continue without disruption. We do this with qualified and experienced diver/technicians, state-of-the-art equipment and advanced techniques that create drydock-like conditions underwater.

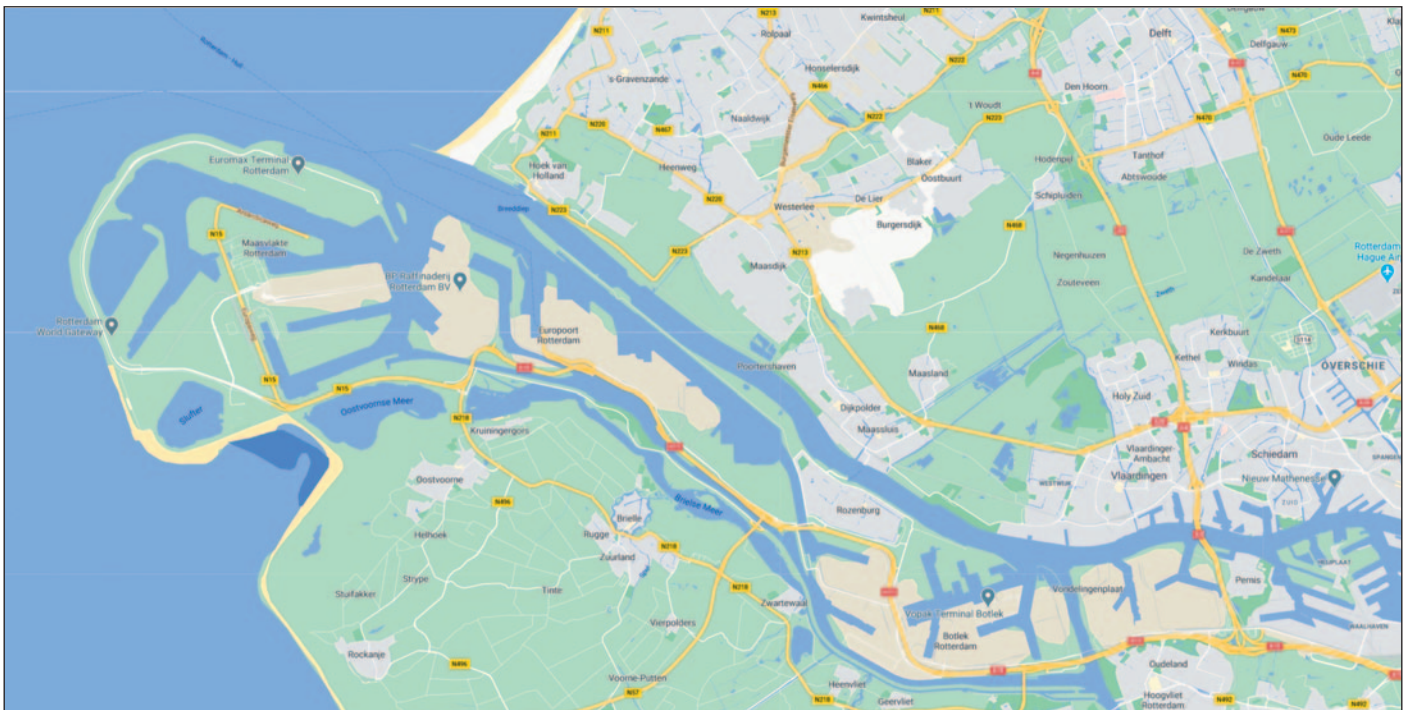


Fully equipped Hydrex workboat, ideal for a fast mobilization.

We have been active in Rotterdam since Hydrex was founded 50 years ago. Examples of recent operations in the port are a bow thruster removal on a container ship and a stern tube seal repair performed on a ro-ro vessel.

Another good example of how we can assist you is a technique called propeller buffing. Keeping a propeller in its optimum shape will give you an instant increase in fuel efficiency, resulting in savings on your fuel bill. By using this method

Easy accessible port





Hydrex work and dive support boat alongside container ship in Rotterdam.



Our workboats are equipped at all times with the materials needed for a wide range of operations.

on a regular basis, we are able to obtain this result.

Please feel free to contact us if you would like to have more information on any of our services or if you want to find out how we can assist you and your vessel. ■

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Our workboats allow us to mobilize throughout the entire port of Antwerp and Rotterdam within hours.

Fast on-site emergency repairs allow vessels to keep sailing

We offer fast on-site repairs in emergency situations. Our teams are ready to mobilize immediately to locations around the world for a wide range of operations. We are at your disposal 24/7 because we know how important it is to have someone you can rely on at all times.

There are many unfortunate events that can stop a ship from sailing. Ships with a leaking stern tube are often not allowed to enter ports. A vessel can be tied up after a collision or a malfunctioning rudder can prevent safe maneuvering. Going to drydock is obviously not an option

in such cases. Arranging the vessel to be unloaded at sea is an organizational and financial disaster for the owner. On top of this it does not solve the problem, because the damaged ship is still unable to leave its location.

We can perform routine repairs as well as permanent underwater repairs to thrusters, propellers, rudders, stern tube seals and damaged or corroded hulls. We create drydock-like conditions around the affected area to perform these operations on-site and within the shortest possible time frame. This allows the vessel to sail again. In most

cases a permanent repair can be performed and no follow-up is needed. If this is not possible, a class approved temporary solution is offered. The ship can then continue its schedule and go to drydock at a more convenient time and location.

Contact us 24/7 if you need immediate assistance. Our technical department is ready to create a tailor-made solution for your specific needs. ■

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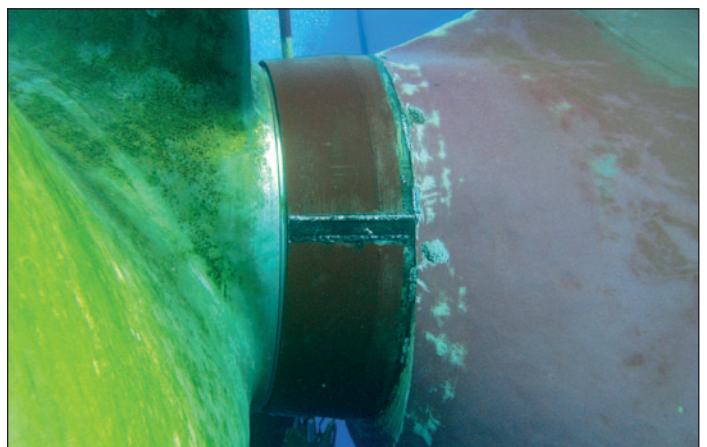
Hydrex team installing a large doubler plate on a bulker in Ivory Coast after collision.



One of our men during emergency scrubber overboard repair in Denmark.



Fast rope guard replacement in Cyprus.



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.

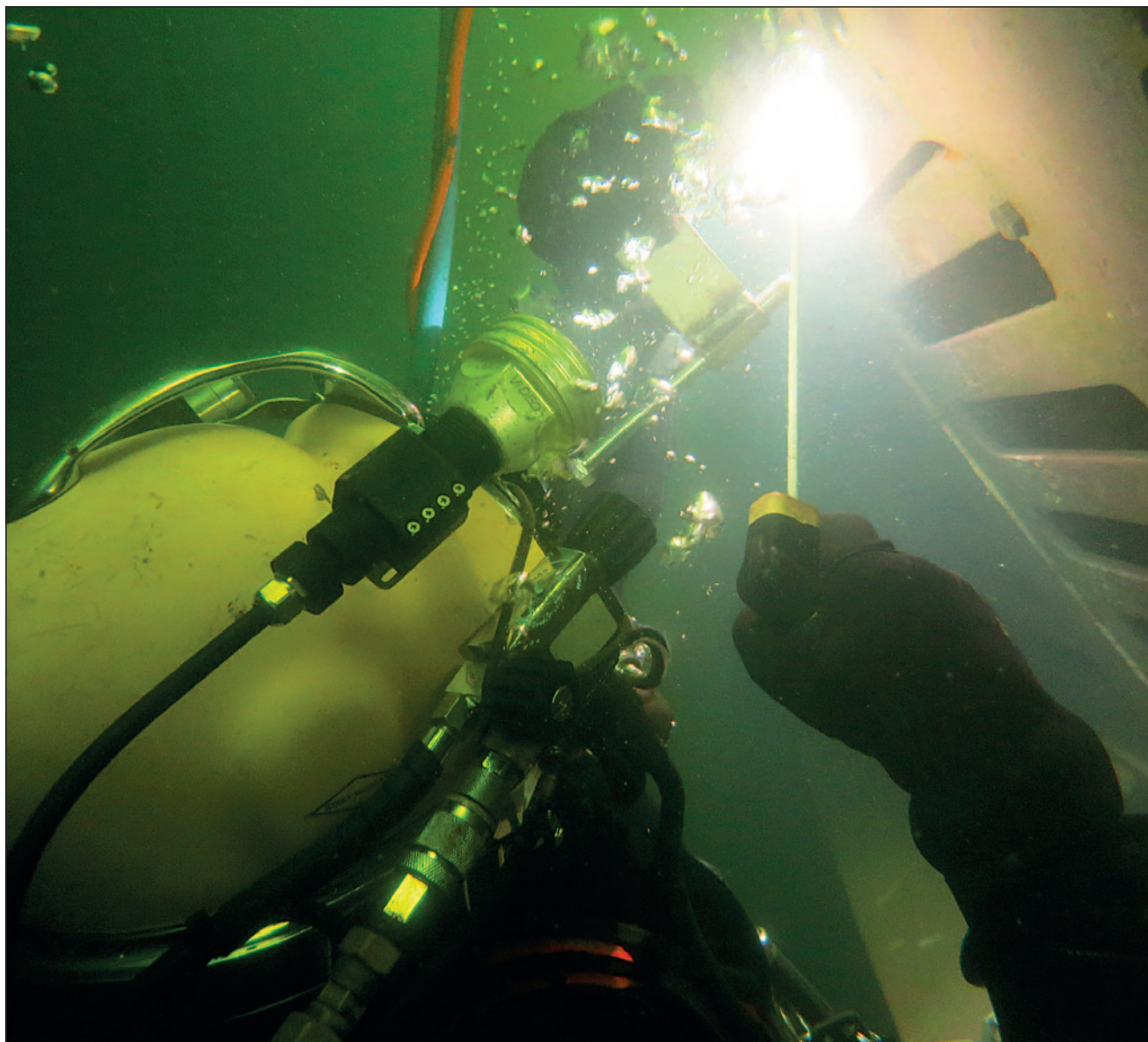
Visit the special stern tube seal repair section on our website for more information and examples of the many seal repairs we have performed in recent years.

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