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KEEPING SHIPS IN BUSINESS

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Underwater services and
technology approved by:



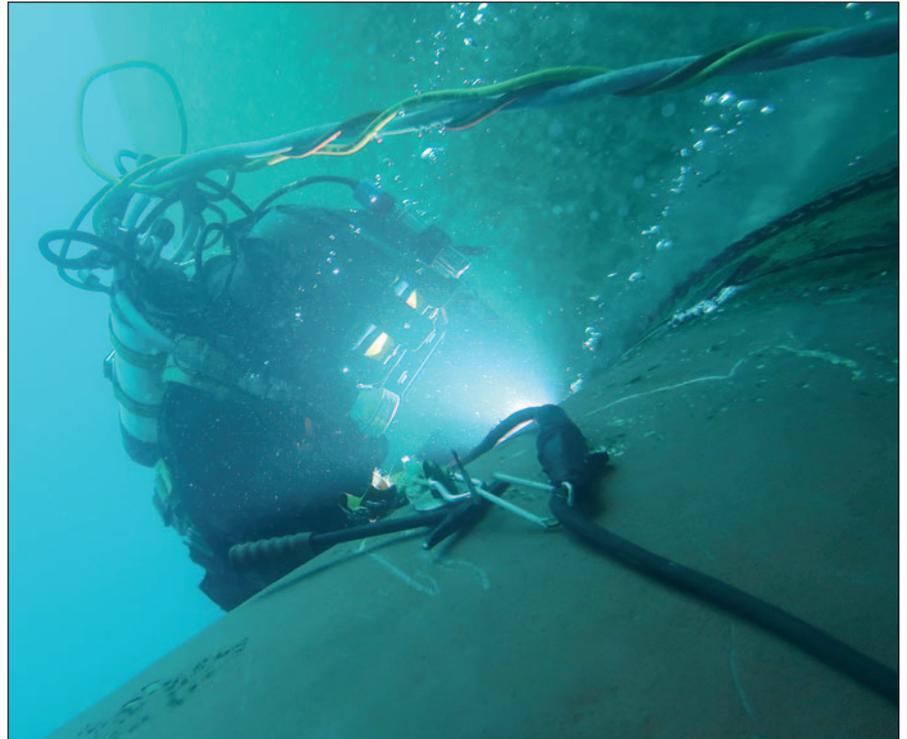
BUREAU
VERITAS



ClassNK



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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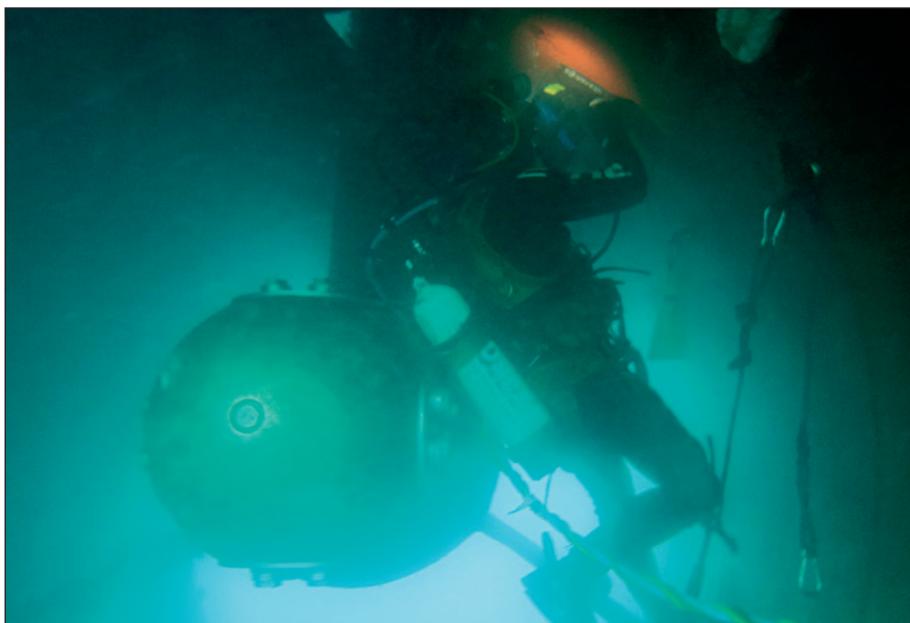
HYDREX
UNDERWATER TECHNOLOGY

Bow thruster replacement in stages keeps cruise ship on schedule

A 208-meter cruise vessel sailing in the Caribbean suffered steering problems after one of its two bow thrusters malfunctioned. Having to depend on assistance every time the ship berthed would quickly become very expensive. Going off-schedule, however, to have the bow thruster replaced would cost the owner both in finance and reputation.

A solution was therefore needed that could be carried out on-site without interrupting the vessel's schedule. Enter our tried and tested flexible mobdock technique and our experienced diver/technicians.

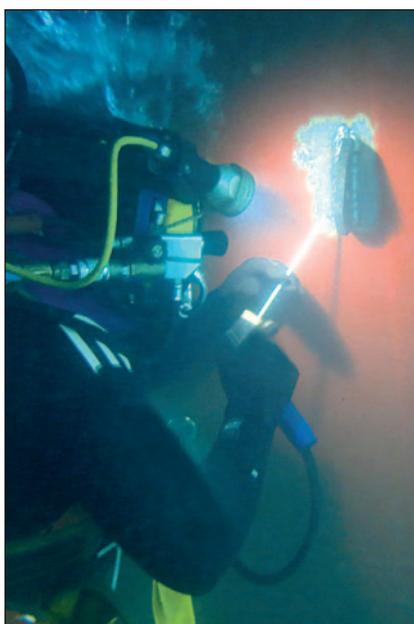
There was only a time frame of eight hours at each port of call during the ship's cruise in the Caribbean. It was therefore important that the operation was split up in parts that could be finished before the vessel had to



Diver inside the thruster tunnel during bow thruster operation.

leave again. A perfect planning and constant communication between our technical department in the

office and our team on location was essential in achieving this. ■



Hydrex diver preparing the thruster tunnel for removal of the unit in the Caribbean.



New bow thruster unit arriving on-site.

Underwater thruster reinstallation avoids delay for container vessel

A month after we removed the bow thruster of a 300-meter container ship our men once again mobilized 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, performed 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 used our flexible mobdocks to close off the thruster tunnel once the overhauled bow thruster had been brought into the tunnel. All water was removed from the tunnel.

This created drydock-like conditions while the vessel stayed afloat. The team then secured the unit and connected it. Once this was done the



Hydrex truck and equipment next to container vessel.



Thruster unit in closed off tunnel.



Repositioning one of the blades.

thruster propeller blades were installed one by one. With these in position the ship was ready to sail.

Our men 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. ■

Fast response keeps vessel on project in Australia

We removed the bow thruster of a large offshore supply vessel and reinstalled the unit after it was overhauled. By carrying out both parts of the operation underwater while the vessel was at anchorage in Dampier, Australia, the ship did not have to go to drydock and could stay on the project.

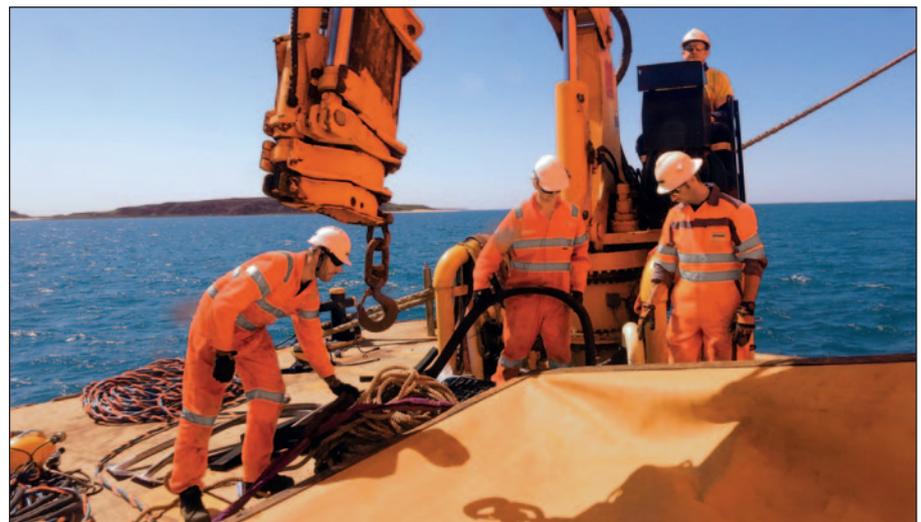
Despite the remote location of the vessel, our technical department was able to make all logistic arrangements and organize a mobilization of the equipment swiftly. Over the years we have carried out many operations in Australia, most of which were done with a limited window of opportunity available.

After our divers removed the bow thruster unit it was brought to a local workshop where it was overhauled by a technician team of the OEM. The Hydrex team remained on stand-by so that they could immediately start the dry reinstallation when the bow thruster arrived back on location.

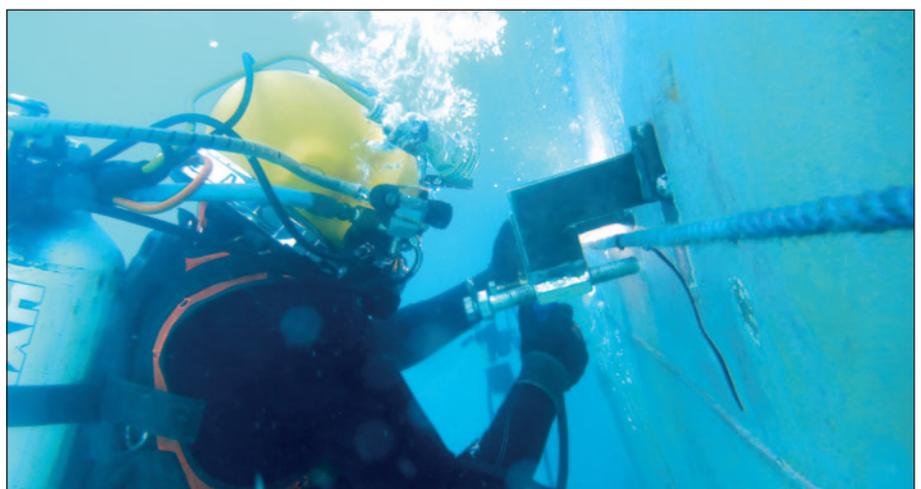
During the entire operation there was a close cooperation with the OEM so that the different parts of the repair were perfectly coordinated. This allowed us to offer the best possible solution to our customer within the shortest possible time-frame. ■



Diver performing welding work on the hull of offshore supply vessel in Australia.



Flexible mobdocks ready for installation.



Preparing the hull for installation of the flexible mobdocks.

Underwater bow thruster repairs

A you can read in the examples on the previous pages, our diver/technicians can perform a wide range of repair or maintenance work on all types of thrusters.

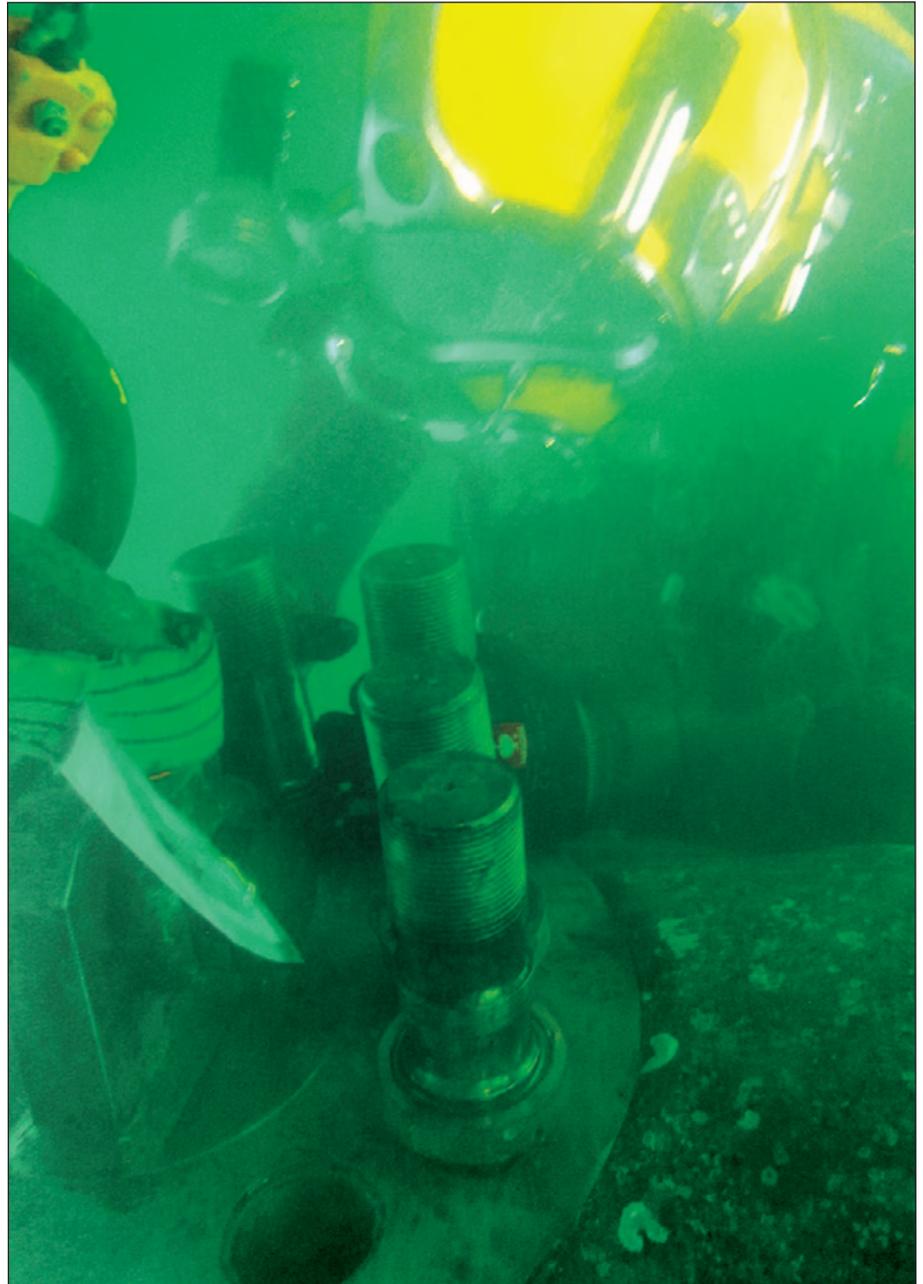
An entire unit can be overhauled, propeller blades and seals can be replaced or repair work on another specific part of a thruster can be performed on-site or inside the tunnel. These repairs are performed in cooperation with OEMs. They can be carried out while the vessel stays afloat with minimum impact on its schedule.

Tunnel thruster operations specifically are carried out using our flexible mobdocks that close off the thruster tunnel on both sides. This allows divers to work in a dry environment around the unit. The lightweight mobdocks can quickly be transported to any location around the world. All operations can be carried out in port during cargo operations or at anchorage.

The size of the thruster does not matter. Our flexible mobdocks can be easily adapted to the circumstances. They can be used for a wide range of repair or maintenance work on all types and sizes of thrusters and vessels.

Performing jobs like these on a tight schedule takes a lot of planning. This can only be done successfully by staff who have familiarity with such operations and the relevant know-how and equipment.

We have a technical department capable of executing all the required



Bow thruster being prepared for removal in Italy.

planning. Our diver/technicians are trained and qualified to perform the full range of required class-approved repair procedures in even the harshest conditions.

An effective, competent team is the only way to consistently achieve a high-quality result in the short periods of time usually available to ships.

Our goal is to give you the most efficient solution while maintaining the highest safety and quality standards. ■

Dive and afloat repair workboats in Rotterdam and Antwerp

Our offices in Antwerp and Rotterdam have workboats available for immediate mobilization. These vessels can be used for a wide range of operations in Belgium, the Netherlands and France.

The catamarans are fully equipped as dive support stations for welding and general repair with hydraulic cranes, hydraulic winches, nautical and communication equipment and a dive 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. Our 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



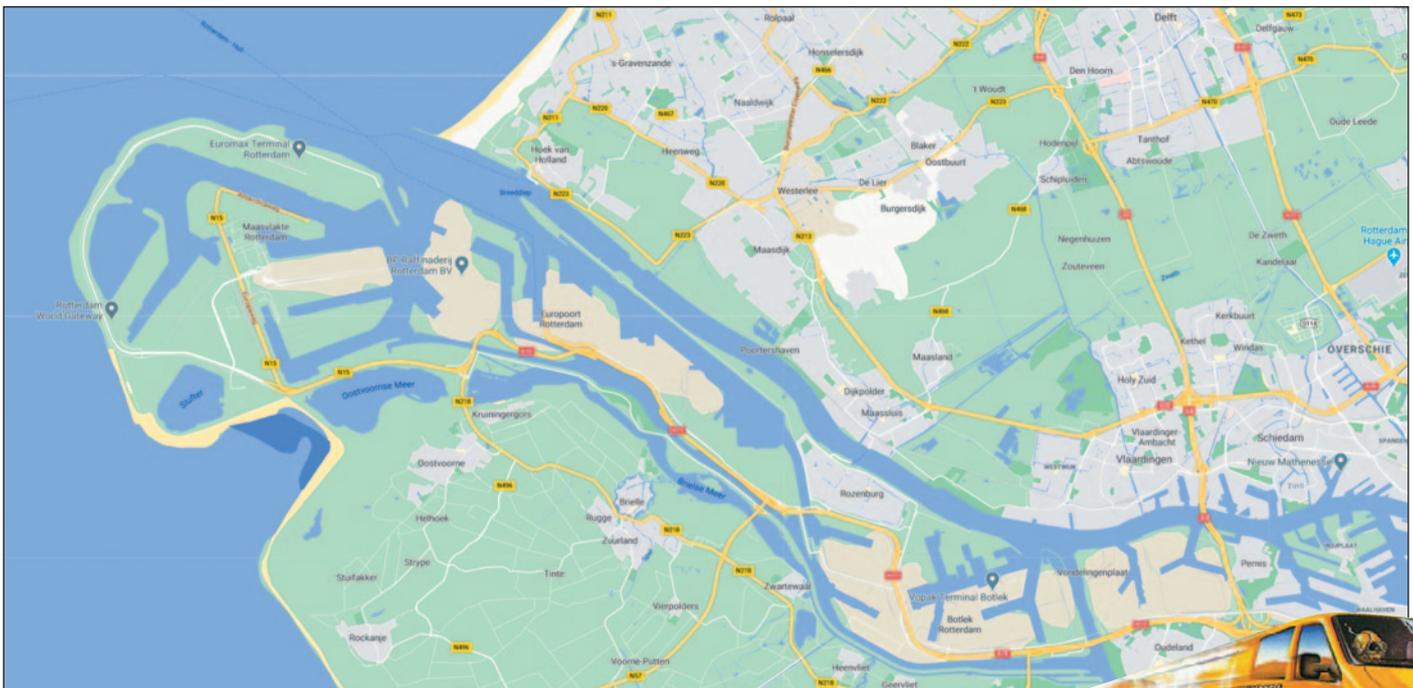
Fully equipped Hydrex workboat, ideal for a fast mobilization.

equipment and advanced techniques that create drydock-like conditions underwater.

The workboats are docked right outside the Antwerp office, where a

wide range of state-of-the-art equipment and tools is available at all times and in the center of the Rotterdam port.

Easily accessible port





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



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



We can mobilize throughout the entire range of Antwerp and Rotterdam.

Hydrex has experienced and certified teams of diver/technicians ready to mobilize together with the workboats. They can carry out routine operations as well as highly technical repair work within a very short time frame and all to Hydrex's well-known high quality standards.

Ready to work throughout the port of Rotterdam

Having our dive support vessels stationed in Rotterdam enables a fast mobilization throughout the entire port without delaying a ship's commercial operations.

We have been active in Rotterdam since Hydrex was founded 47 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 roro 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 effi-



Hydrex has experienced diver/technicians ready to mobilize together with the workboats.



Both workboats are fully equipped as dive support stations.



Hydrex workboat during operation.



The workboats are stationed in Antwerp and Rotterdam where a wide range of extra equipment is available.

ciency, resulting in savings on your fuel bill. By using this method on a regular basis, we are able to obtain this result. ■

Please feel free to contact us 24/7 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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Mooring with equipment next to tanker during underwater operation.

Scrubber pipe repairs and lasting protection



Exhaust scrubbers filter out all harmful toxins from exhaust gasses 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.

Contact us for more information on scrubber pipe replacements.

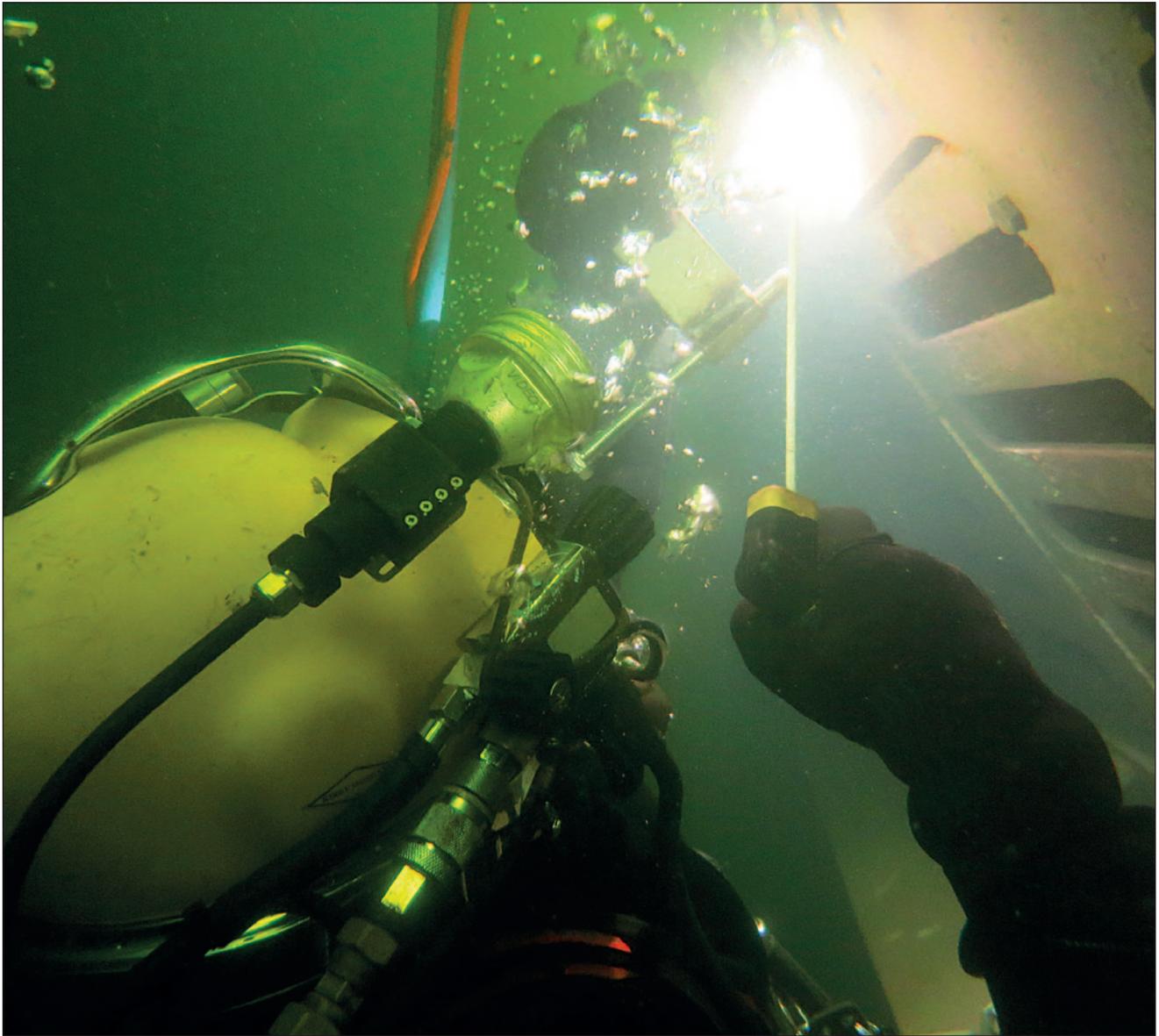


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