HYDREX®

UNDERWATER TECHNOLOGY

NEWS

LETTER | 354

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The solution to scrubber corrosion

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. 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.

Bow thruster operations without drydock delays

Bow thruster problems can quickly become operational problems. Damage to propeller blades, malfunctioning feedback systems, and the need for major overhauls can all affect a vessel's maneuverability and disrupt carefully planned schedules. Whether on a container vessel in Rotterdam, a cruise ship in Phuket, or an offshore vessel in Australia, shipowners facing these challenges are often confronted with costly delays and unscheduled drydock visits.

Hydrex workboat in Rotterdam.

Bow thruster maintenance can involve a wide range of operations, from replacing damaged blades and repairing internal components to removing complete units for overhaul. Traditionally, much of this work would require drydocking the vessel, often resulting in significant costs, and disruption to commercial schedules. By performing these operations underwater, we can often eliminate the need for a drydock visit altogether and significantly reduce the time a vessel needs to spend out of service. The following case studies show how this approach has been applied in different locations around the world and under a variety of circumstances.

Bow thruster unit lifted out of the water in Rotterdam.

Case studies

The Netherlands: keeping a container vessel on schedule

A 363-meter container vessel required the underwater removal of its bow thruster for overhaul. The vessel was calling at Rotterdam, but its schedule allowed only a very short window for the operation.

Hydrex diver/technician team approaching container vessel in Rotterdam.

To reduce the time needed in port, we split the project into stages. During an earlier stop in Le Havre, France, our diver/technicians prepared the thruster tunnel so that the final removal could be completed more quickly once the ship arrived in Rotterdam.

When the vessel reached Rotterdam, our team mobilized to the ship and carried out the underwater removal within the available time frame. The bow thruster unit was detached, removed from the tunnel, and delivered to the manufacturer for overhaul.

By preparing the operation in advance and completing the removal underwater, we helped the owner avoid additional off-hire time and keep the vessel's schedule intact.

Overhauled bow thruster arriving on-site in Piombino.

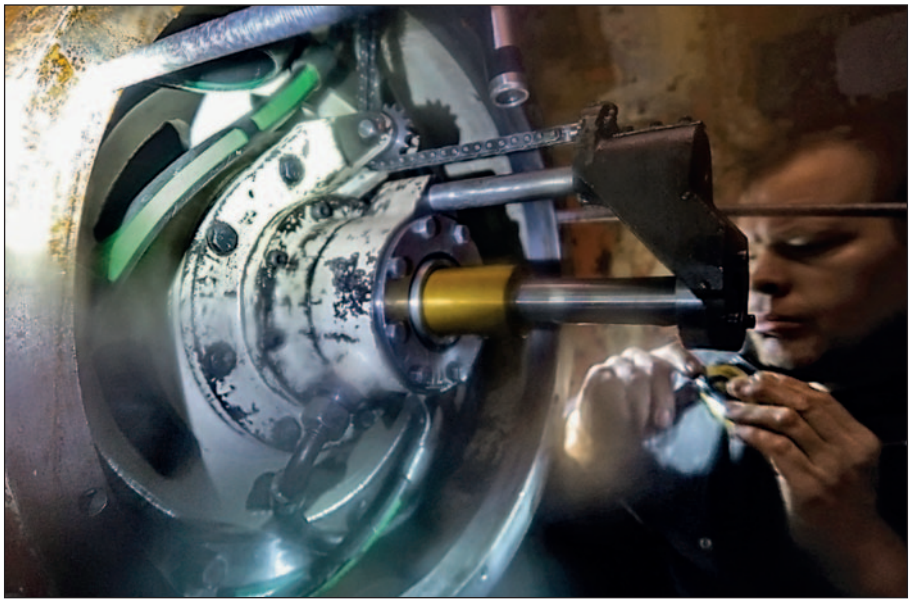
Italy: reinstalling an overhauled thruster during a single stop

In Piombino, we carried out the underwater reinstallation of an overhauled bow thruster on a 300-meter container ship. The unit had been removed by our divers a month earlier because the vessel's schedule did not allow the entire project to be completed in one port call.

For the reinstallation, the available time window was slightly larger. This allowed our team to complete the job during a single stop. Once the overhauled unit was maneuvered back into the thruster tunnel, our flexible mobdocks were installed to

Installing one of the blade bolts in Italy.

After installing our flexible mobdocks, all water was removed from the thruster tunnel of the cruise vessel.



Installing the repaired part of the feedback system in Phuket.

Permanent in-water rudder repairs now possible without drydocking

Hydrex has developed an entirely new method enabling permanent repairs of rudders without drydocking the ship. Permanent repairs were hitherto not possible and ships had to drydock in case a major defect was found. The newly designed equipment is light-weight and can be mobilized very rapidly in our special flight containers.

Major defects on rudders very often cause unscheduled drydocking of ships. The new method designed by our technical department allows engineers, welders and inspectors to perform their tasks in dry conditions. Class approved permanent repairs on-site, without moving the ship, are now possible and commercial operations can continue. Steel repairs and replacements can be performed and pintle and bushing defects can be solved without the loss of time and money associated with drydocking.

The equipment can be mobilized within hours to any port in the world and is available for rapid mobilization from the Hydrex headquarters in Antwerp.

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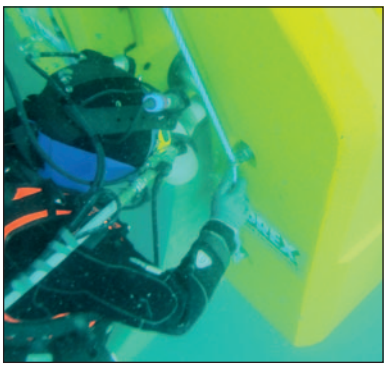
Fast underwater propeller blade straightening



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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close off the tunnel and create a dry working environment.

With the water pumped out, our diver/technicians secured and connected the unit. After the propeller blades had been installed one by one, the thruster was tested to confirm that it was functioning correctly.

Our teams worked in shifts around the clock to finish the operation as quickly as possible. As a result, the charterer did not have to worry about delays to the vessel's schedule.

Thailand: repairing a cruise ship thruster afloat

A 200-meter cruise ship in Phuket, Thailand, began to have problems with the feedback system that indicates the position of the bow thruster blades. Because the vessel was operating on a strict cruise itinerary, taking it out of service for drydock repairs was not an option.

In cooperation with the thruster manufacturer, our technical department developed a repair plan that allowed the work to be carried out afloat without removing the complete unit from the tunnel.

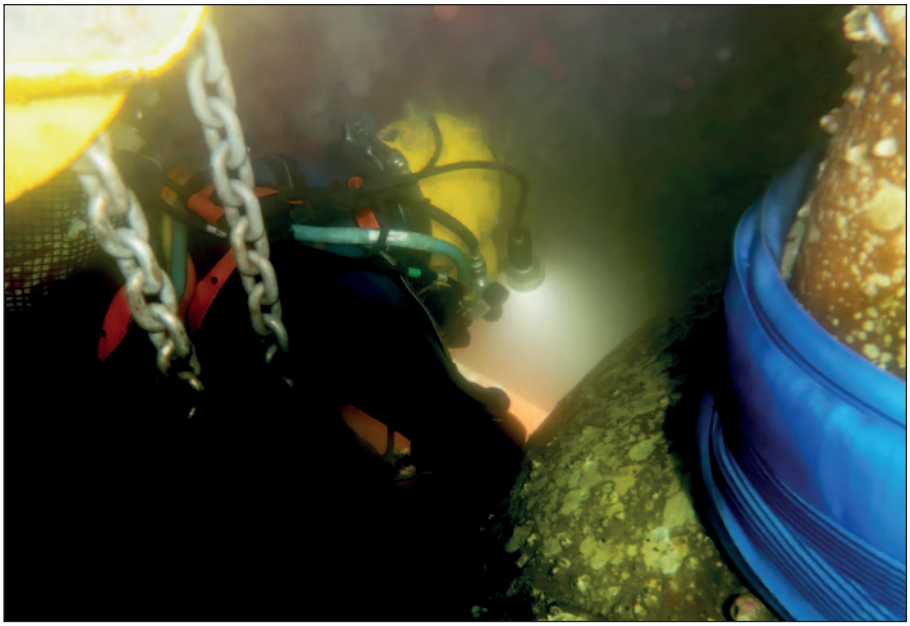
We mobilized a diver/technician team to Phuket and installed our flexible mobdocks to create dry working conditions inside the tunnel. The team inspected the unit, removed the cover of the gearbox, and carried out the necessary repairs to the damaged feedback system.

Close cooperation with the vessel's crew, the OEM, and all other parties involved contributed to the rapid and efficient completion of the project. The owner avoided a drydock visit, saved valuable time, and kept the cruise ship on schedule.

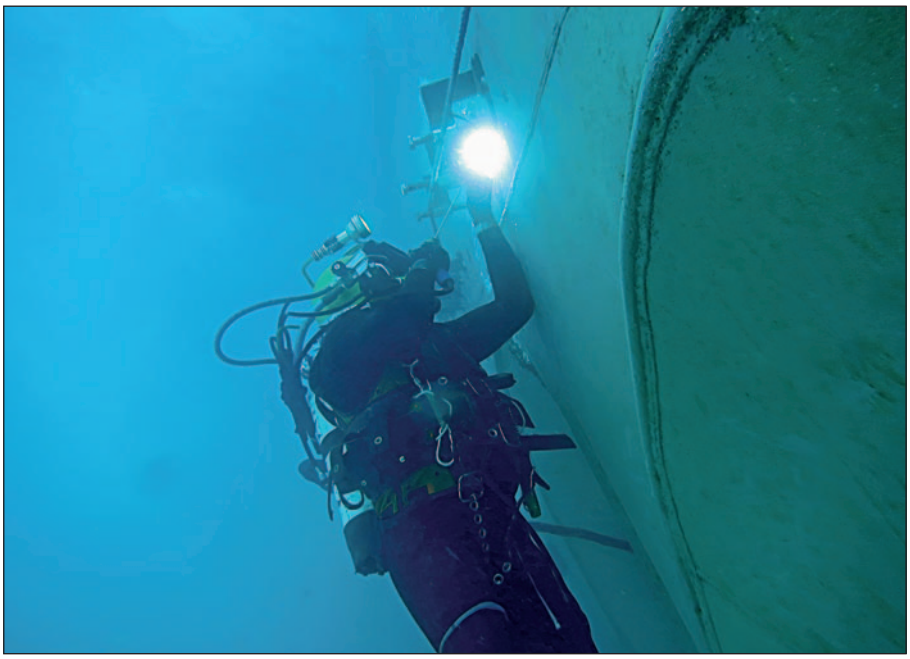
Spain: underwater bow thruster removal from a 306-meter container ship

In Algeciras, we were asked to remove the bow thruster of a 306-meter container vessel while the ship remained afloat.

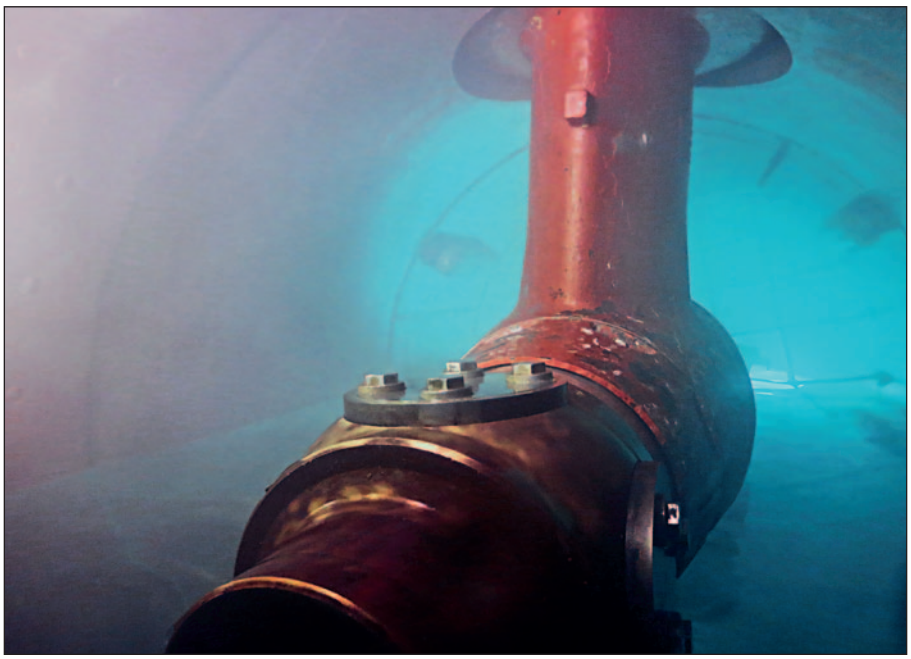
After setting up a monitoring station, our diver/technicians began by detaching the blades one by one. At



Hydrex diver during removal of bow thruster in Algeciras.



Diver performing welding work on the hull in Dampier.



Thruster unit inside underwater habitat.

the same time, preparations were made in the bow thruster engine room to prevent any ingress of water once the unit was removed.

The gearbox was then secured with hoisting equipment. After the unit was disconnected from the engine room, it was lowered onto a cradle specifically designed for these types of operations. The bow thruster was then brought to the surface and prepared for transport to the workshop.

By carrying out the removal underwater, we enabled the owner to stay out of drydock and keep the vessel's operational disruption to a minimum.

Australia: complete removal and reinstallation at anchorage

One of our more demanding bow thruster projects took place at anchorage in Dampier, on an 82-meter offshore supply vessel. The owner needed the thruster removed, overhauled, and reinstalled, but sending the vessel to drydock would have taken it away from its project.

Despite the remote location, our technical department quickly arranged the practical and logistical requirements. As the vessel sailed

Hydrex diver getting ready for underwater operation

... and taking the plunge.

Hydrex diver performing final inspection of reinstalled thruster blades.

toward Dampier, our diver/technician team mobilized as well.

Once the vessel was at anchorage, part of the team prepared the bow thruster engine room, while the underwater team removed the tunnel grids and detached the blades. Blind flanges were installed to prevent oil leaking from the thruster during the removal.

The thruster unit was removed from the tunnel using our purpose-designed and built cradle and brought onboard the workboat in one lift with the vessel's crane. It was then transported to a local workshop, where it was overhauled by an OEM technician team.

Our team remained on standby so the reinstallation could begin as soon as the unit returned. The overhauled thruster was brought back into the tunnel using the reverse procedure. Flexible mobdocks were then installed to create a dry environment, allowing our diver/technicians to secure the gearbox, reinstall the propeller blades, reconnect the unit to the engine room, and carry out leakage testing.

Because both the removal and reinstallation were performed underwater, the vessel stayed on project and avoided a drydock visit.

A practical solution for demanding schedules

These projects show the range of bow thruster operations that can be carried out underwater. Each project was different, but the objective was the same: give the owner a safe, efficient, and practical alternative to drydocking.

By combining experienced diver/technicians, in-house engineering, flexible mobdock technology, and close cooperation with OEMs, we can help vessel operators keep their ships sailing while essential bow thruster work is completed. ■

The solution to scrubber corrosion

More and more ships are being fitted with Exhaust Gas Cleaning Systems (EGCS or, more commonly, scrubbers) so that they can use cheaper, heavy fuel without violating regulations. But there is a problem: inadequately protected mild steel is easily corroded by the scrubbers' highly acidic wastewater. Corrosion of the scrubber overboard pipe is a threat to the integrity of the hull. This often occurs between drydocking. The question is how to effect a repair without going to drydock or going off-hire.

Corroded scrubber pipes can cause severe leaks.

Hydrex and sister company Subsea Industries solved this problem in 2019. We developed procedures to replace the final section of pipe with the ship afloat and without interrupting its schedule. We also developed a proprietary and patented method of preventing the same trouble from recurring.

This technique has been implemented successfully on well over 100 scrubber overboard pipes for some thirty different shipping companies to date – container ships, bulkers, tankers and reefers.

Preparation on board one of our workboats for a scrubber pipe operation.

Coating the carbon steel with Subsea Industries' patented, chemical resistant Ecoshield coating prevents further corrosion. The procedure has been approved by the major classification societies. So as not to interrupt a ship's schedule, the repairs can be carried out in several stages at different ports of call if necessary. This applies particularly to container ships.

Hydrex technician cutting away the old pipe.

Scrubber pipe secured and ready for full penetration weld.

Hydrex has the operation down to a fine art of coordinated and invariable steps and procedures. Mild steel replacement pipes are prefabricated and protected with Ecoshield. Stainless steel is not used, so as to avoid dissimilar-metal galvanic corrosion between hull and pipe.

The results have been successful in every case where coated carbon steel pipes were used to replace the corroded overboard pipes.

Avoid costly damage

Our teams have also replaced pipes preemptively. These pipes were already starting to corrode, and a leak would have been a matter of time. By performing the replacement before the leak occurred, our divers prevented a costly unscheduled repair later.

The frame and brackets are cut through to make way for the new pipe.

New scrubber pipe after welding.

New scrubber pipe coated with Ecoshield.

While it is easy to carry out the repairs with the ship afloat, Eco-speed protection of the scrubber when it is first installed preempts any problems with corrosion when the scrubber is in use.

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. ■

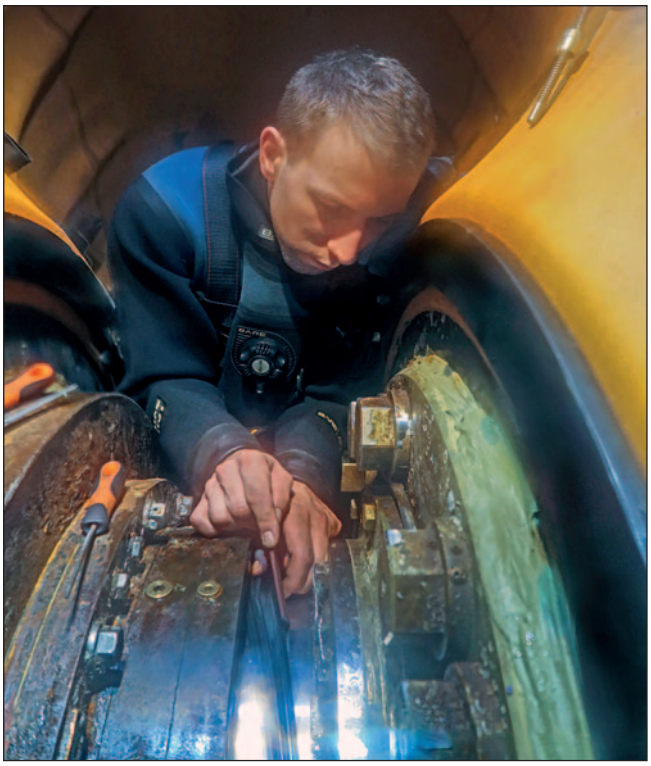
If you have received this magazine at the wrong address or if your company is going to move, please let us know.

You can contact us at:
hydrex@hydrex.be
or at
+ 32 3 213 53 00

KEEPING SHIPS IN BUSINESS

All welding work is done following our class approved procedures.

The most cost-effective stern tube seal repair/replacement available anywhere



- Immediate response to minimize vessel downtime
- Accurate estimates with final invoices that match
- Typical stern tube seal repair/replacement by Hydrex: Two (2) days start to finish
- All major brands repaired/replaced

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