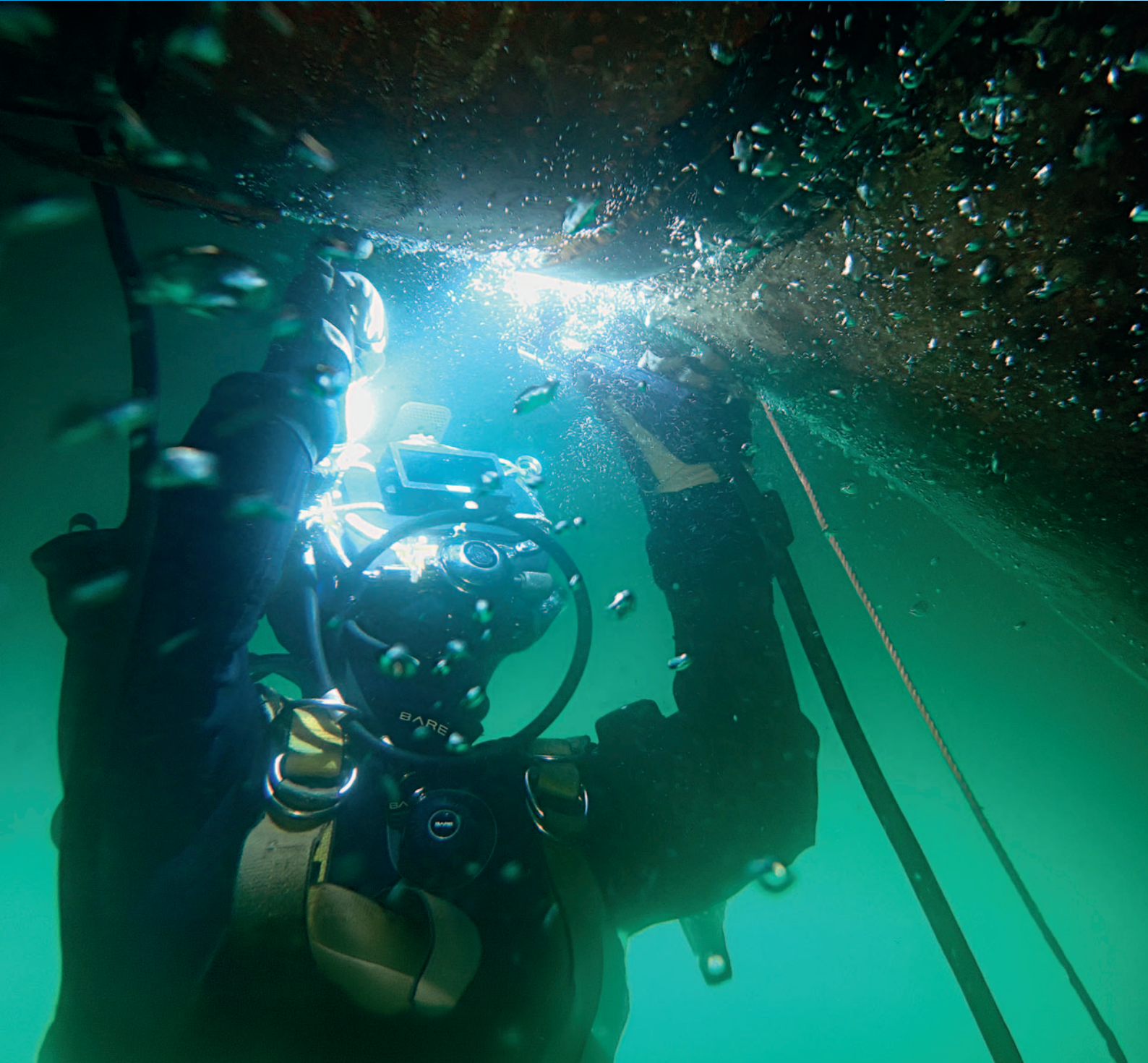




UNDERWATER TECHNOLOGY

Magazine

Number 357



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*A ship that needs repairs
deserves the best,
anywhere, anytime.
We promise quality
and deliver it.*



Editorial



In shipping, time is one of the most valuable commodities. When a vessel requires an urgent repair, every lost or wasted hour can affect schedules, operations and profitability. At Hydrex, our goal is simple: solve the problem and get the vessel moving again as quickly as possible. The first article in this magazine clearly illustrates this.

That starts the moment we receive your call. Our teams are available 24/7, and we aim to assess requirements, prepare the right people and equipment, and organize logistics without delay. Careful planning means our divers arrive ready to work rather than waiting for equipment, support or instructions.

But saving time does not mean rushing the job. Safety and quality

always come first. Our experience, training and preparation allow us to work efficiently while delivering a reliable result. Wherever possible, our underwater solutions also avoid drydocking, helping customers prevent lengthy interruptions to their schedules.

For us, speed is ultimately about giving something valuable back to our customers: time.

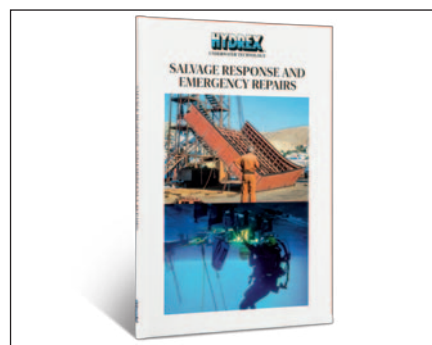
A stylized black ink signature of Boud Van Rompay.

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Underwater stern tube seal replacement in under 48 hours in Algeciras

Last month, one of our diver/technician teams carried out an underwater stern tube seal replacement on a 180-meter container ship berthed in Algeciras. Seawater had been found in the air chamber and the seal leak alarm had gone off, confirming that the seals were damaged and needed to be replaced.

Using one of our flexible mobdocks, the team was able to carry out the entire operation on-site and underwater, saving the owner an expensive and time-consuming trip to drydock.

Once the operation was approved, all preparations were handled swiftly, and the required equipment was mobilized to the vessel. Because the ship's mooring location could only be reached via the water, our team made use of a workboat during the operation.



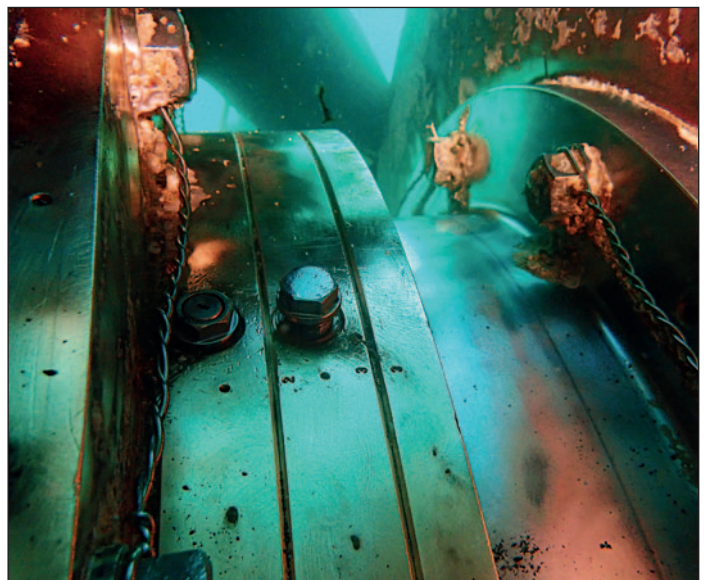
Hydrex team on workboat approaching the container ship in Algeciras.

The operation started with the removal of the rope guard. Our diver/technicians then took a tail

shaft wear-down measurement and cleaned the seal housing components.



Stern tube seal assembly after removal of ropeguard...



and after cleaning.

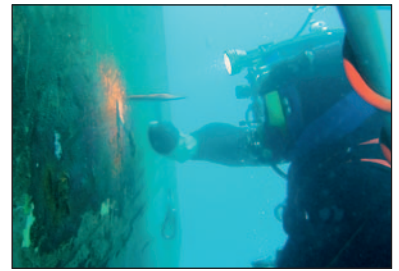


Diver working on the seals inside flexible mobdock.



Fishing net tangled around the seals.

Hydrex underwater inspections



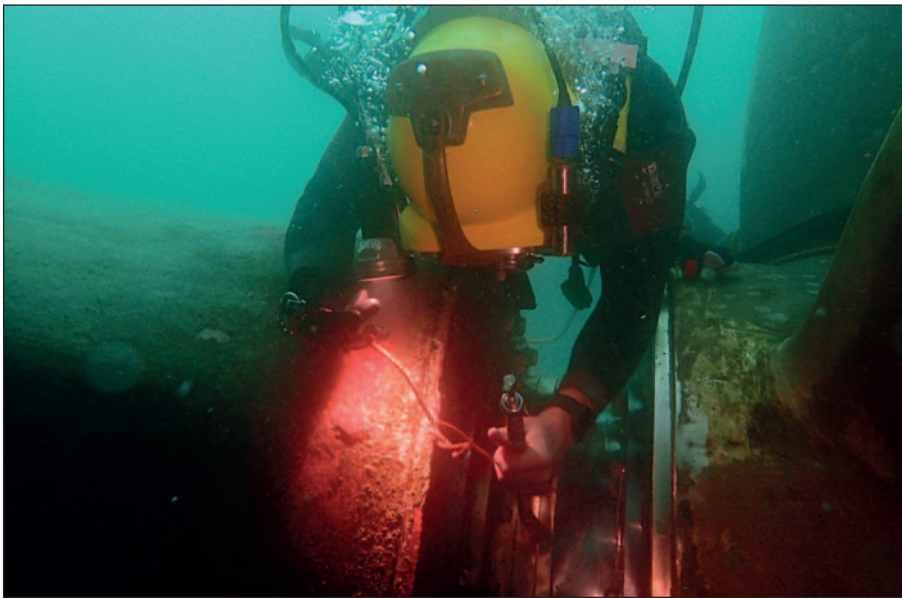
Underwater inspections are an essential aspect of ship repairs. Building upon conventional technical skills and know-how while also taking advantage of the latest technology, Hydrex offers a unique hull monitoring service to its customers. This gives ship-owners total control of the underwater hull and 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 shipowners. 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.

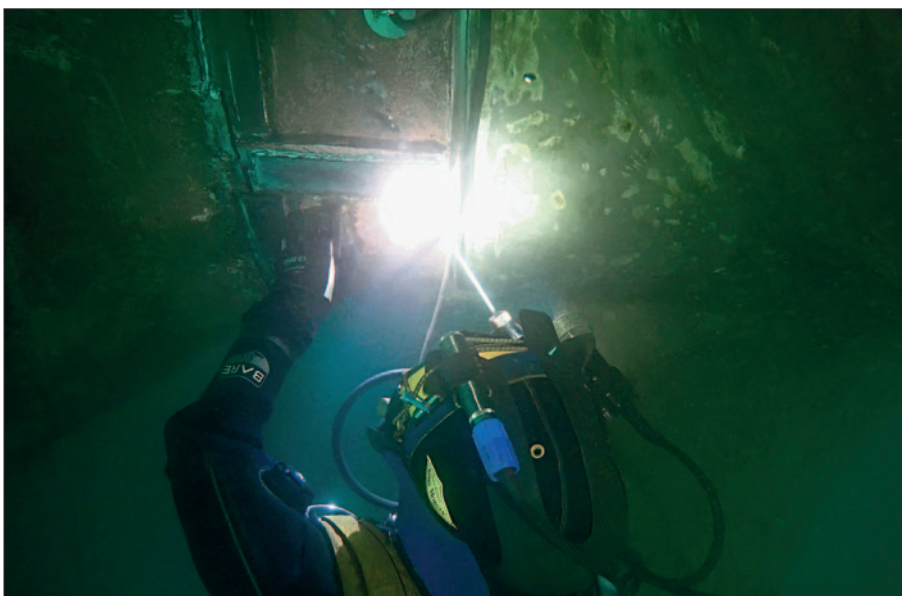




Hydrex diver taking tailshaft wear down measurements.



Reinstallation of the assembly after seal replacement.



Hydrex diver during reinstallation of the ropeguard.

The flexible mobdock was installed around the stern tube seal assembly. Communication systems, a camera and lighting were installed inside the habitat, creating a dry underwater environment where our technicians could work in drydock-like conditions.

The intermediate rings were then opened and the liner and rings thoroughly cleaned. A fishing net tangled around the damaged seals was removed by our divers. New seals were then installed and bonded, after which the intermediate rings were closed again.

A successful operation was concluded with leakage tests, the removal of the flexible mobdock and the reinstallation of the rope guard.

Working in drydock-like conditions on-site

Taking advantage of the Hydrex flexible mobdock technique, the entire seal replacement could be carried out with the vessel afloat. The system creates a dry working environment around the stern tube seal assembly, allowing our diver/technicians to perform the work under conditions similar to those in drydock.

Having the equipment and experienced personnel available for rapid mobilization also means that repairs can be organized without losing valuable time. This is especially important when a damaged stern tube seal requires immediate attention.

Despite changing currents at the location, the team was able to carry out the complete procedure as planned in just under 48 hours.

The fact that Hydrex organized



Reinstalling the ropeguard to finalize the operation.



The stern tube seal assembly with ropeguard after conclusion of the repair.



Hydrex equipment and dive station on workboat next to container ship.

everything from start to finish meant that the owner did not have to make separate arrangements for the underwater part of the repair. Our team arrived at the ship with the equipment needed to carry out the seal replacement and complete the operation on-site. ■

If you ever encounter a similar situation, give us a call. We can then tell you if the repair is feasible and, if it is, start working on its handling.

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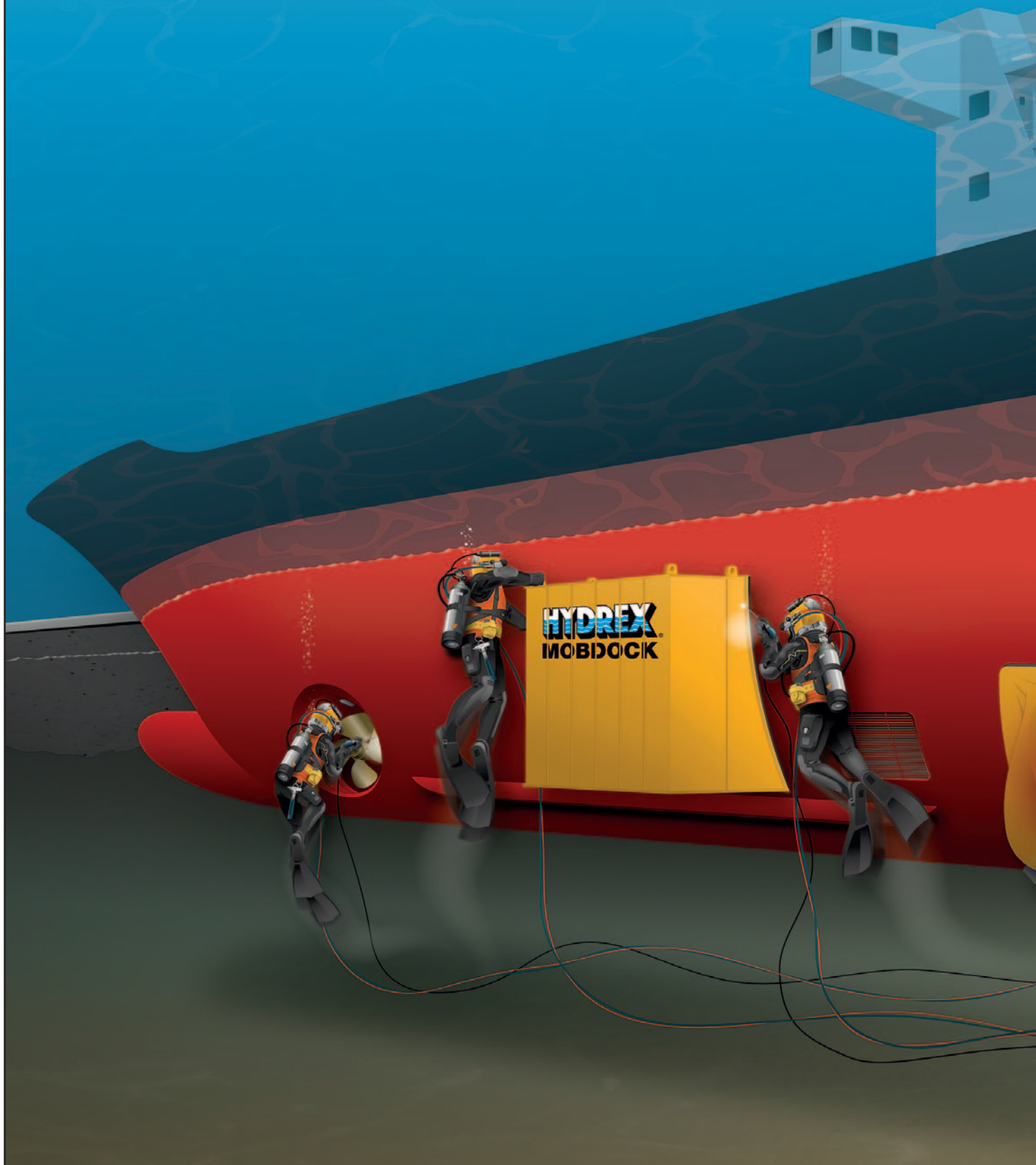
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You can contact us at:
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**KEEPING SHIPS
IN BUSINESS**

Pit lane





Salvage Response & Emergency Repairs - new book

When there is a major shipping casualty – a collision, a grounding, or, especially relevant these days, an attack – there is a decision to be made by the owner, ship manager, and often the insurance company: Do we need to contact a salvage company? Is there another, less costly solution we can try first?

In such situations, time is usually compressed. Often the decisions need to be made in a hurry and frequently without the luxury of having all the relevant information to hand. Experience, expertise and judgement all play a vital role.

The correct decision can save millions.

The choice

Many repairs to a severely damaged ship can be carried out in situ with the ship afloat and fully laden: no need to lighten or go to drydock; minimal off-hire time. These repairs may be temporary or permanent. In the case of temporary repairs, the damage is patched sufficiently for the ship to sail safely, often to a drydock where permanent repairs can be effected. With permanent repairs, the ship can continue operating without condition of class and adhere to its normal drydock schedule.

Temporary repairs

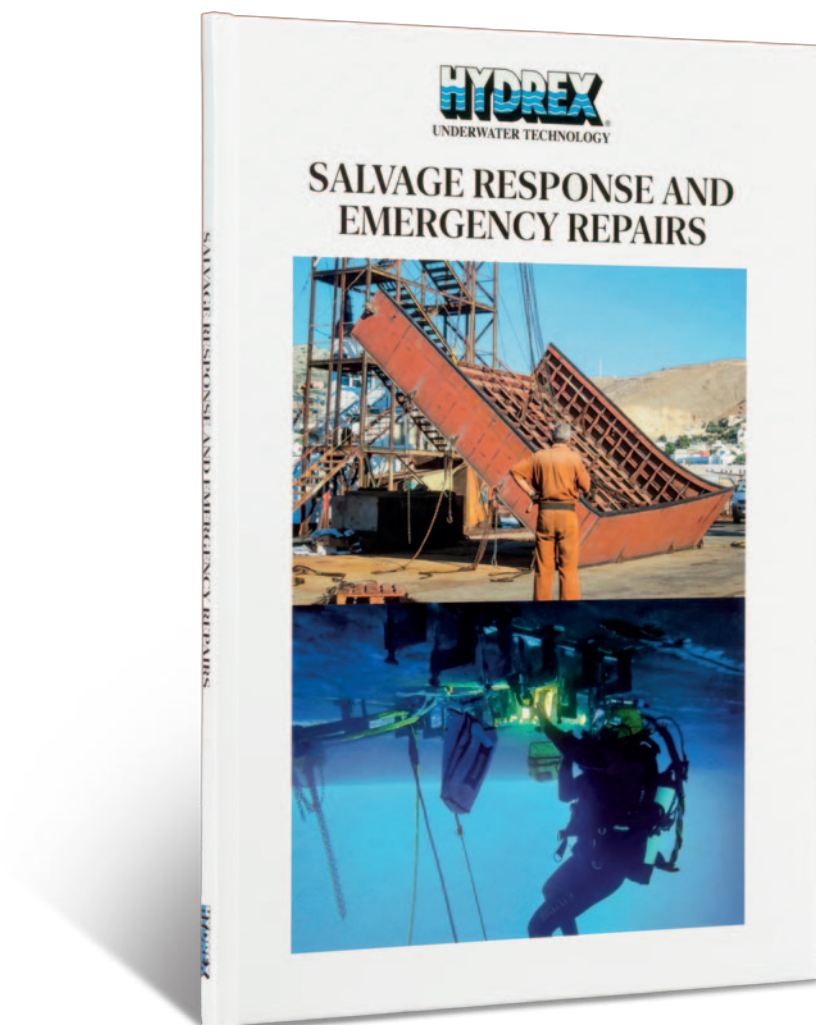
If a ship has struck a rock and is holed, or has suffered some similar mishap, the damage can often be

repaired with a doubler plate or a cofferdam which makes the hull watertight and allows the ship to continue on its way. It can be an eye-opener to find out how extensive the damage can be and still be repairable. The actual repair needed is determined in collaboration with the class inspector involved. Each case is treated individually.

Such a temporary repair carries with it a condition of class. This could require regular inspections or stipulate a finite date by which the permanent repairs need to be completed.

Permanent repairs

Whenever possible, we will propose and then carry out a permanent repair. This involves installing a cofferdam outside the damaged area so that cutting, grinding and full penetration welding can be carried out in dry conditions, so that the section of damaged plating is completely replaced. The technicians work from inside the vessel or, in the case of an open top cofferdam, inside the cofferdam itself on the outside of the hull.



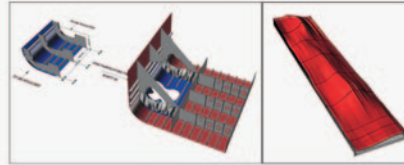
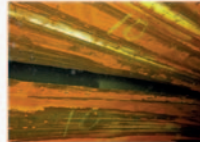
**When ships are in trouble anywhere in the world,
Hydrex intervention saves owners
and operators time and money**

Frederikshavn, Denmark

A major maritime salvage operation with a renowned salvage company was a world's first in underwater repair: the insertion of a complete, prefabricated replacement hull section in a badly damaged ship at anchor.

The *Sigurno* had run aground on the Tjersborg Bank, about 23.5 miles east of Frederikshavn, Denmark, while on passage from Finland to China.

The ship was carrying 74000 metric tons of iron ore pellets. After the ship was lightened and towed to Frederikshavn, the salvage company contracted Hydrex to carry out the very extensive repairs needed in order to make the ship seaworthy and able to sail. The temporary repair made it possible for the ship to sail to China to drydock, saving the owner hundreds of thousands of dollars for the full repair.



Hydrex's role

As with any inquiry we receive, we do not charge for our initial consultation to determine the feasibility and cost of an underwater intervention on a major casualty, whether the job materializes or not (onsite underwater inspection, if required, is not included). This means that shipowners, managers and insurers can avail themselves of our extensive experience with these situations before they make a final decision, and they can do this at no cost. We also work rapidly as it is understood that such casualties are emergency situations.

If we determine that an underwater repair is feasible with the ship afloat, the next step is an estimate for the repairs, including any engineering and fabrication required. If the estimate is accepted, we go to work rapidly to carry out the repair in the shortest time possible. We mobilize our experienced diver/technicians and arrange local support as needed. Working around the clock in collaboration with the class inspector involved, we inspect, measure, calculate, decide whether a permanent

repair is possible or a temporary one would be more viable, we then do any needed engineering, fabrication and installation so that the ship is seaworthy again.

If we find that the damage is too extensive or difficult to repair under the conditions the ship is currently in, we make this known so that the owner or insurance company can proceed to salvage as the best solution.

Combining salvage and underwater repair

As you will see in our free book, *Salvage Response and Emergency Repairs*, there have been cases where a salvage company takes on a particular casualty and then contracts with Hydrex to carry out repairs so that the ship can sail to drydock. This is a hybrid approach which has worked well.

Free book, *Salvage Response and Emergency Repairs*

We have compiled many of our successful major underwater repairs

into a book: *Salvage Response and Emergency Repairs*. If you are interested, you can request a copy of this book here <https://hydrex.be/salvage-repair/> and we will be glad to send it to you at no cost. The book provides a spectrum of cases where underwater repair was able to rescue the situation and allow the ship to continue sailing.

When the unpredictable happens

Not every serious marine casualty can be addressed with underwater repair. Salvage is a vital part of ship operations where the damage is simply too extensive to be repaired with the ship afloat. It's important to make the right determination. There is time to gather the necessary information, have the ship inspected by competent divers and technicians if needed, and make an informed decision: repair on site, underwater? Or initiate a salvage operation? ■

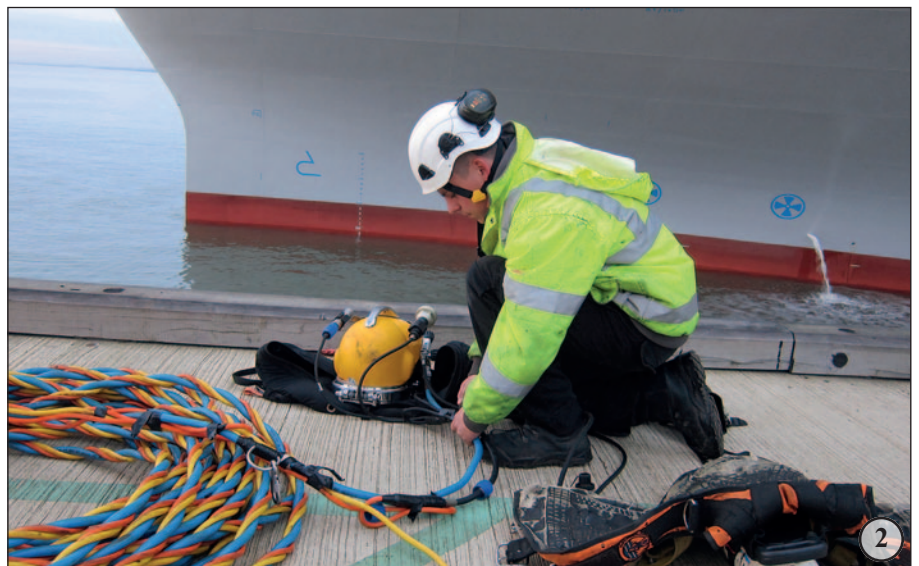


Meticulous attention to detail on every job

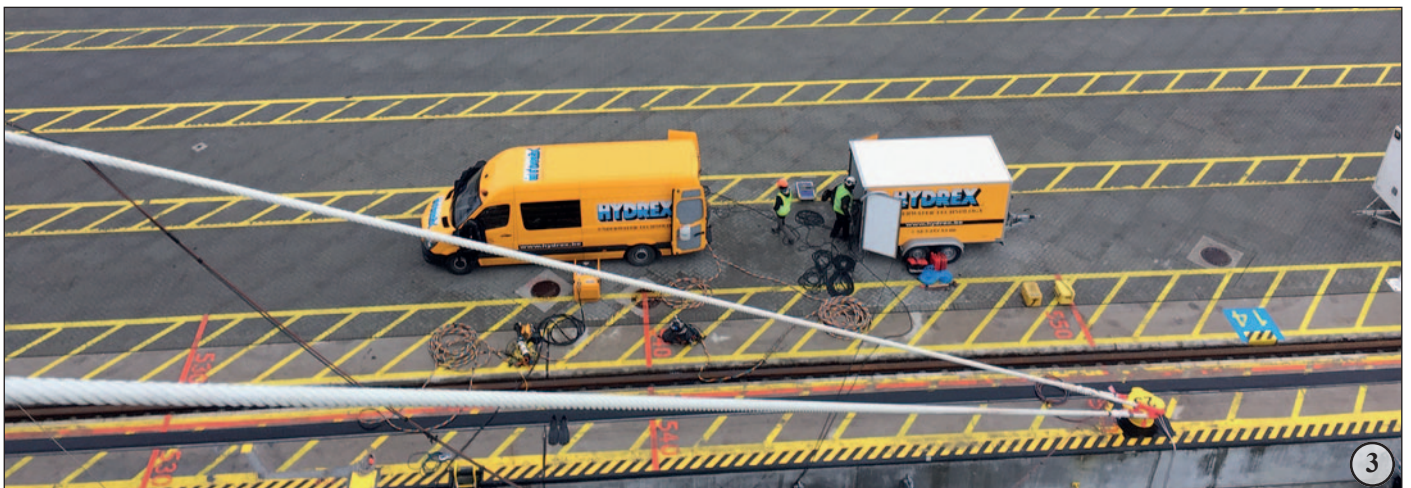
1. A swift reaction remains one of the most important elements of our services. Our fast response centers are designed for immediate action whenever needed. A wide range of additional state-of-the-art equipment and tools is available at all times in our fast response center and can be loaded onto our workboats or vans immediately.

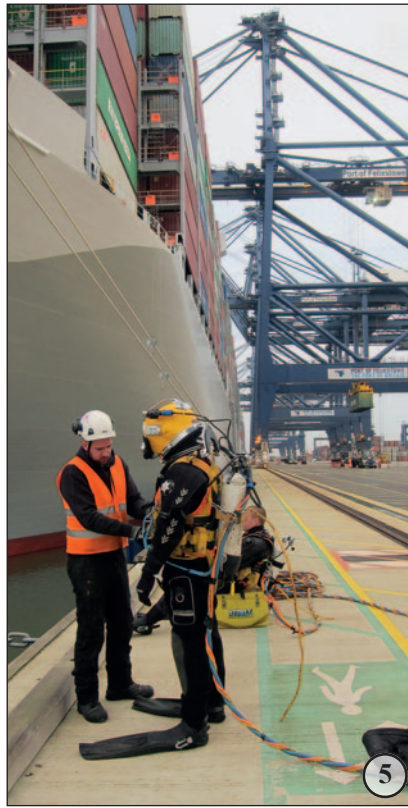


2. Hydrex team member making a final check of the diving equipment before an underwater operation. Safety is one of the most important elements of any job we carry out and making sure every piece of equipment is in perfect shape at all times is essential in achieving this.



3. Every few years our entire fleet of vehicles is refurbished or replaced if needed. Trucks and vans are repainted and new vehicle graphics are applied. The inside of the vans is also updated regularly to turn them into state-of-the-art mobile monitoring stations.



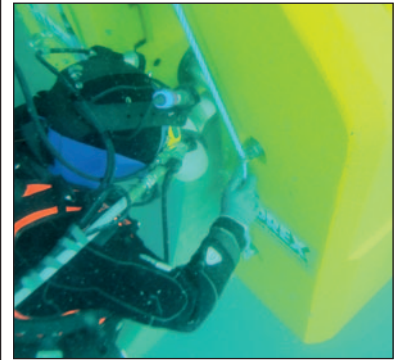


4. All underwater operations are followed from the shore by the team leader. All our vans and workboats are equipped as monitoring stations at all times. This allows us to mobilize immediately.
5. We want to offer the highest quality of service to our customers. To achieve this we need staff who are familiar with a

wide range of operations as well as the relevant know-how. Our diver/technicians are trained and qualified to perform all class-approved repair procedures.

6. When their training is completed, our diver/welders can carry out both simple and complex jobs and achieve this uniformly without loss of time, quality or safety.

Fast underwater propeller blade straightening

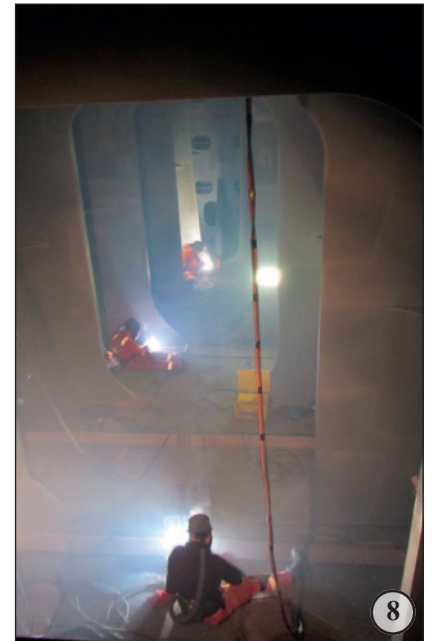


In its quest to provide cost effective services to customers, Hydrex developed procedures to address different kinds of damage to propellers. This research led to the design of the Hydrex cold straightening machines first used in 2002.

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.

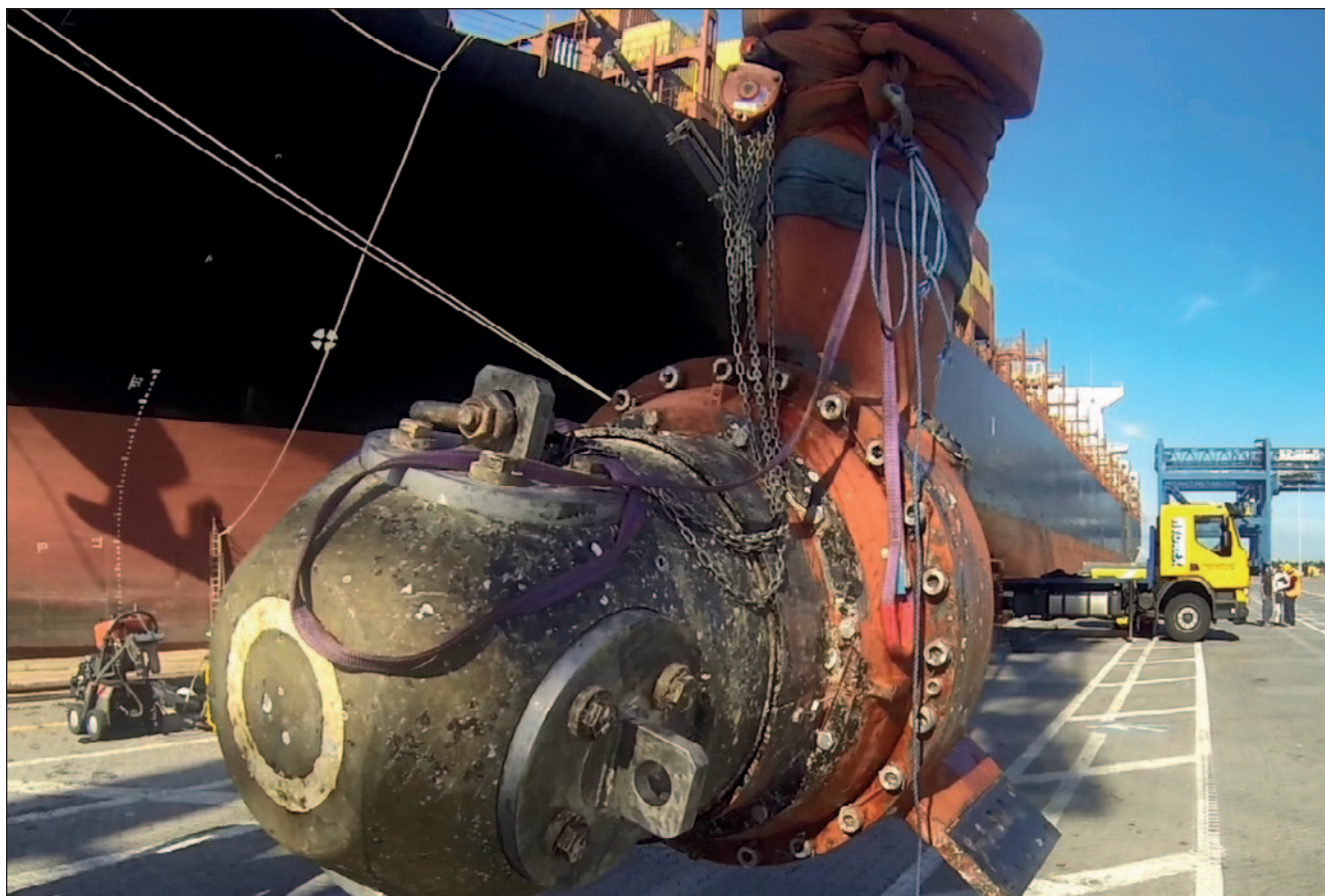
The cold straightening machines have been in use for quite some time now but the Hydrex research department has been looking into ways to expand the technique even further to improve our services. A new version of the straightening machine was recently put into practice. It is compatible with the existing models and is used to restore more severely bent propeller blades to their original condition.

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7. All welding work is carried out by certified Hydrex welders. They follow both external courses and in-house training. Underwater welding as well as dry welding can be trained at our fast response centers.
8. Our team members have to be flexible during an operation. They have to be able to respond to changes if the need arises. This is very important because they are the ears and eyes of our technical department during an operation.
9. Working in shifts is just one of the many ways in which we can adapt to a customer's needs. We know how important a schedule is for a ship and we make sure any operation is completed in the shortest possible time-frame.
10. One of our divers getting ready for underwater operation during a nightshift. By doing this our teams can work around the clock to save precious time for a ship owner.

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.

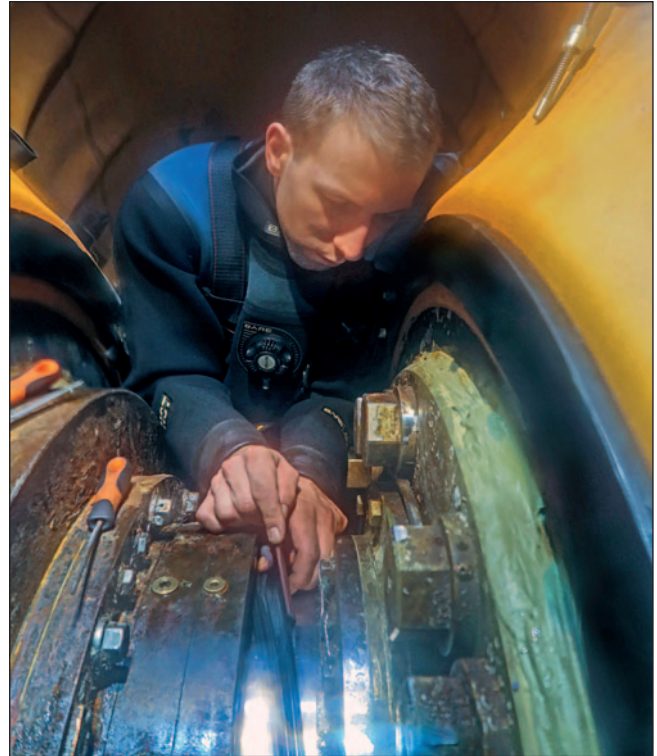
There is no need to send the vessel to drydock as all operations can be carried out in port or while the vessel is stationary at sea. Normal commercial activities can therefore continue without disruption.

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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

We're here when you need us



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hydrex@hydrex.be

For more information visit www.hydrex.be