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Always high quality, no matter the job

KEEPING SHIPS IN BUSINESS

ISO 9001 certified

Underwater services and technology approved by:



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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Double underwater stern tube seal repair in Tasmania

Recently one of our diver/technician teams carried out a double underwater stern tube seal repair on a ro-ro ship berthed in Port of Burnie, Tasmania. The ship was suffering from an oil leak, making an on-site repair necessary. Using two Hydrex flexible mobdocks simultaneously 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.

After arriving on-site, the diving team first set up a monitoring station next to the vessel. The operation then started with a thorough underwater inspection of the stern tube seal assemblies.

After the inspection the divers cleaned the assemblies and installed both flexible mobdocks. By doing this they created a dry underwater



Performing stern tube seal operations on site allows a vessel to stay on schedule.

environment so that they could work in drydock-like conditions.

The exact same procedure was followed on both stern tube seal assemblies. The split ring was first disconnected and brought to the surface to be cleaned. After cleaning the entire

assembly, the divers removed the first seal and replaced it with a new one which was then bonded. This was done in cooperation with the supervising OEM technician. The procedure was repeated with the other three seals.

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

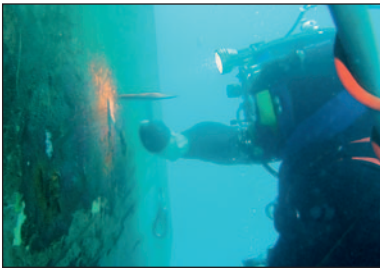
Despite the remote location of the ro-ro vessel, our technical department was able to make all practical logistic arrangements and organize a mobilization of the equipment very swiftly. In the recent past we have carried out several operations in Australia, including repairs on this ro-ro ship's sister vessel.



Hydrex diver inside flexible mobdock during seal replacement in Tasmania.



Hydrex under-water inspections

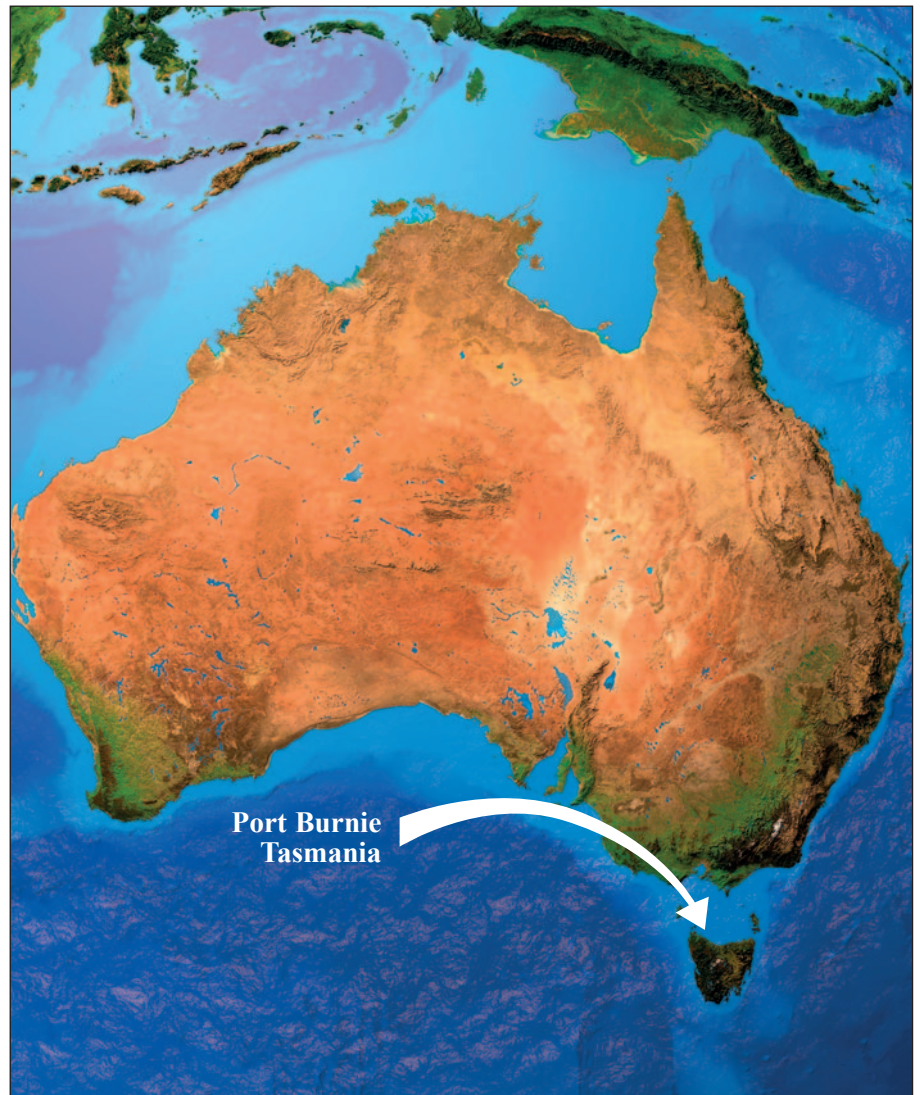


Underwater inspections are an essential aspect of ship repairs. Building upon conventional technical skills and know-how while also taking advantage of the latest technology, Hydrex offers a unique hull monitoring service to its customers. This gives ship owners total control of the underwater hull and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



Seal assembly of ro-ro ship prior to the repair.



Seal assembly after stern tube seal replacement.

The same high quality, close to home or faraway

Taking advantage of our flexible mobdock technique the men were able to carry out the entire repair on-site and underwater. Because all the required material is ready to be

transported at all times, no time is lost making preparations.

With Hydrex organizing everything from start to finish, the owner did not have to worry about making any arrangements for the repair. After the seals had been successfully

replaced he could sail his vessel to her next stop free of oil leaks.

We have developed a flexible mobdock repair method that enables the underwater replacement of all types and sizes of shaft seals. It allows ship owners to keep their vessels



The reinstallation of the ropeguard concluded the repair.

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. Therefore this new service is now available world-wide.

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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Inside the flexible mobdock the divers can work in drydock-like condition.

sailing, saving precious time and money.

Damaged stern tube seals will cause oil leaks or an ingress of water. By replacing the seals as soon as possible we can keep the down time low. Because seal repairs can be performed during cargo operations the ship can keep its schedule.

It is not always straightforward to replace seals. There can be quite a bit of variation in the size of the stern tube itself and, for instance, the liners can be worn down and show ruts. However, all this is routinely handled by our experienced teams.

All our offices are equipped with the latest facilities, lightweight equipment and tools. This allowed for a timely arrival of the team in Tasmania with everything needed to successfully complete the job. ■

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

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Hydrex permanent hull repairs out of drydock



Hydrex carries out permanent hull repairs without interruption of operations, approved by all major classification societies.

Hydrex developed and delivers **permanent hull repairs on vessels afloat, fully approved by all the major classification societies. No need to go to drydock. No need to redo later in drydock. Gets your ship back in business fast, saving time and money.**

How is it done?

1. We start off with an inspection to determine extent of defect.
2. Made-to-measure cofferdam secured on outside of hull to keep water out and create a dry environment during repair.
3. Crack removal/defective plating cropped.
4. Insert fitted.
5. Insert tacked in place.
6. Class approved full penetration welding from inside the ship and frame renewed as needed.
7. Independent ultrasonic testing to verify the welding.
8. The cofferdam is then removed.

Each step is checked by class before proceeding.



Cofferdam placed over crack.



Removing the damaged area.



Preparing the edge of the opening for the new insert.



Insert cut and fitted.



Insert tacked in place.



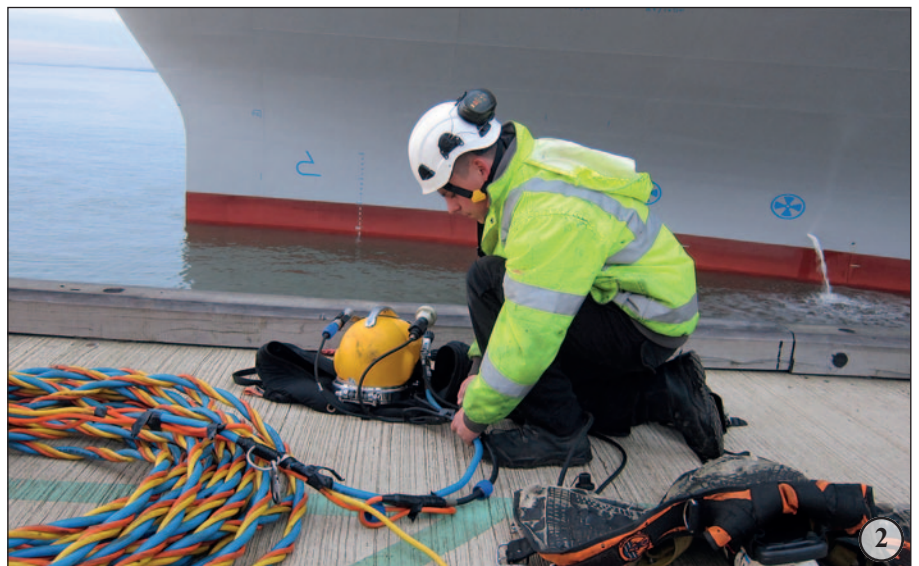
Full penetration weld.

Always high quality, no matter the job

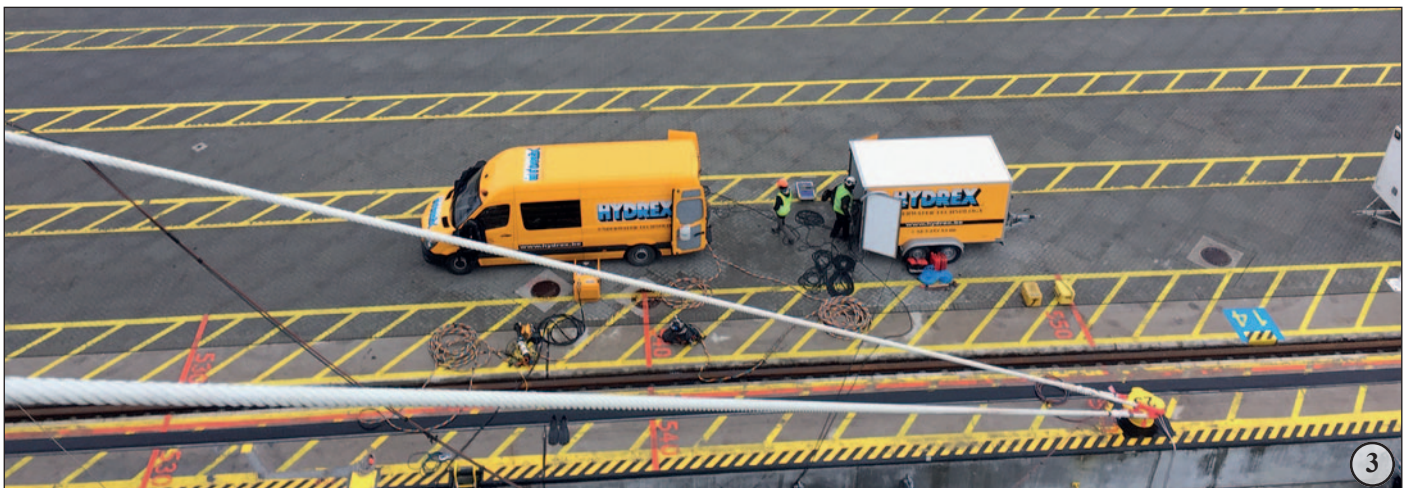
1. A swift reaction remains one of the most important elements of our services. Our fast response centers are designed for immediate action whenever needed. A wide range of additional state-of-the-art equipment and tools is available at all times in our fast response center and can be loaded onto our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

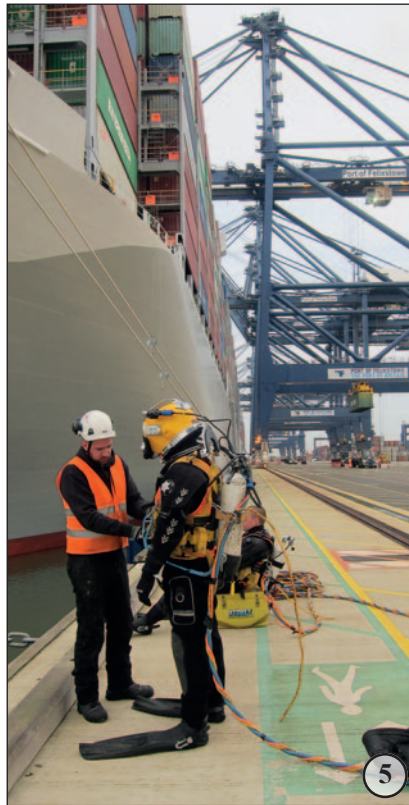


2. Hydrex team member making a final check of the diving equipment before an underwater operation. Safety is one of the most important elements of any job we carry out and making sure every piece of equipment is in perfect shape at all times is essential in achieving this.



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.



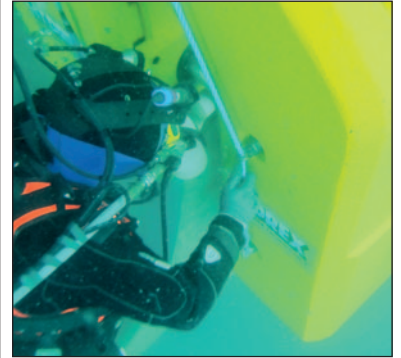


4. All underwater operations are followed from the shore by the team leader. All our vans and workboats are equipped as monitoring stations at all times. This allows us to mobilize immediately.
5. We want to offer the highest quality of service to our customers. To achieve this we need staff who are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

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.

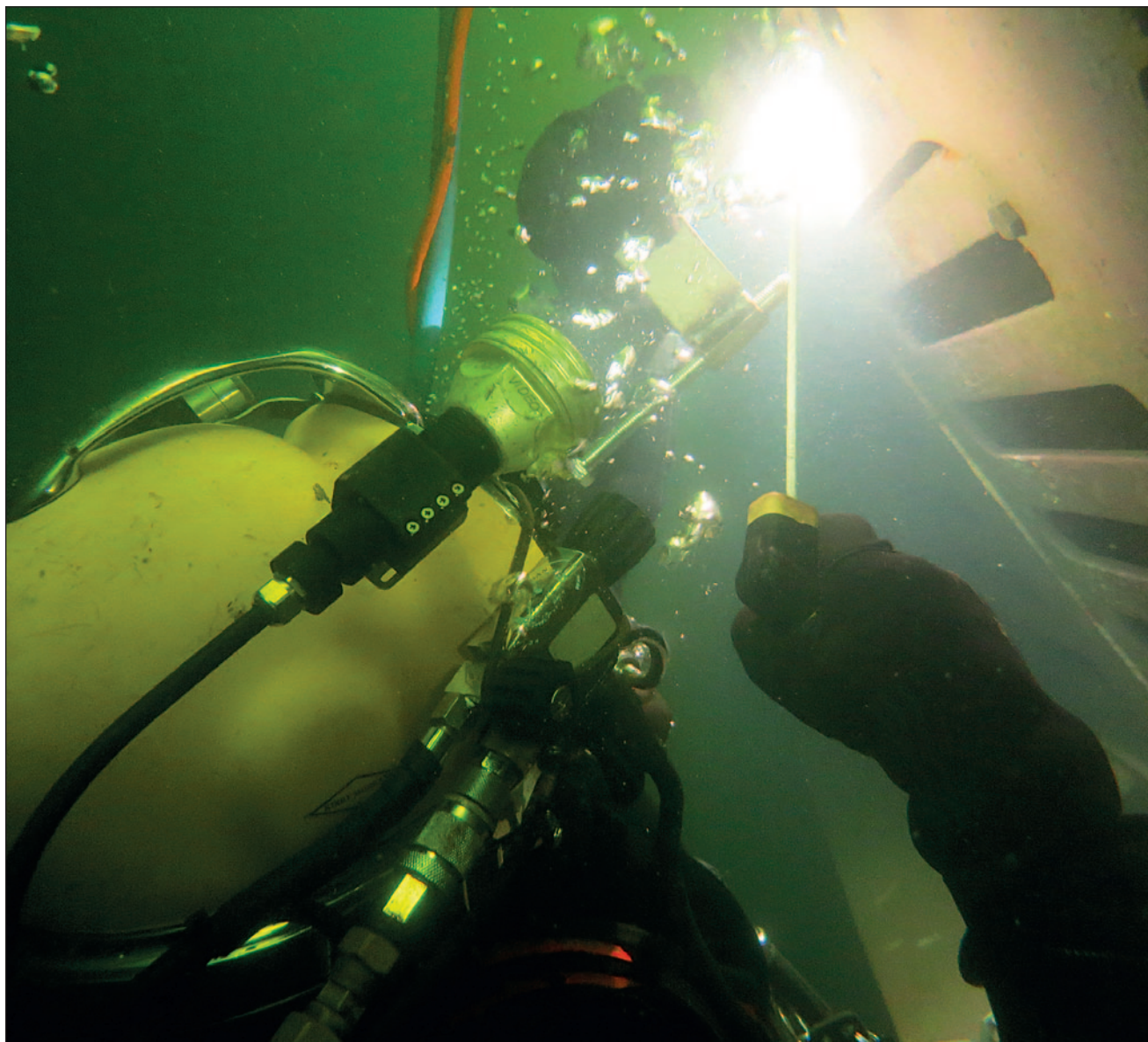


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