



Keeping cold stacked offshore vessels safe.....	3
Afloat propeller operations in ARA-region	8

Contents

Page 3 - 6

Keeping cold stacked offshore vessels safe

Page 8 - 11

Afloat propeller operations in ARA-region

KEEPING SHIPS IN BUSINESS

ISO 9001 certified

Underwater services and technology approved by:



Stern tube seal repairs



Using our flexible mobdock method to create a dry under-water environment, we have carried out stern tube seal repairs and replacements under-water 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.



Phone: + 32 3 213 5300 (24/7)

Fax: + 32 3 213 5321

hydrex@hydrex.be

www.hydrex.be

Keeping cold stacked offshore vessels safe

A team of our diver/welders blanked all underwater openings of four offshore vessel to keep them safe during a cold stacking period. This was done in Dunkerque, France, over a period of four weeks starting in the middle of February.

Two hydrographic survey vessels, an oceanographic vessel and an offshore installation vessel are layed up in Dunkerque for a long period. It is essential that they are kept safe during this period.

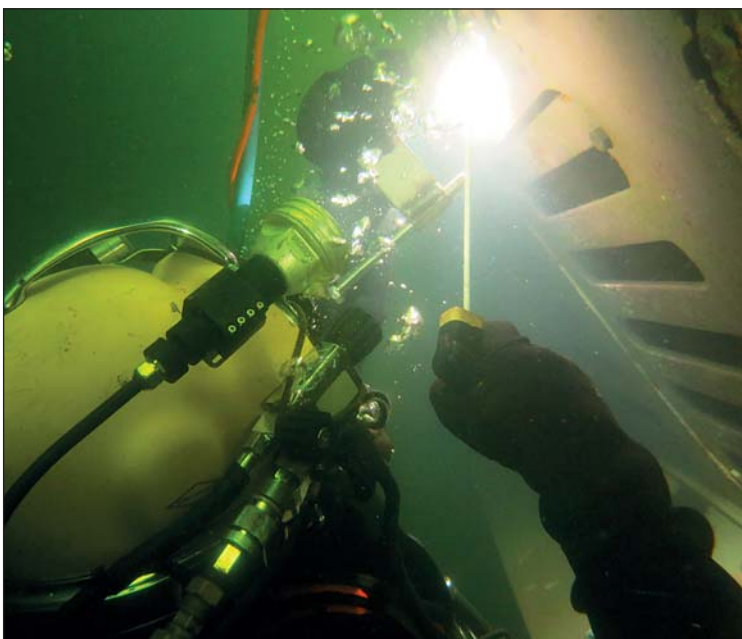
Especially the underwater part of the ships needed additional protection against the constant exposure to salty seawater. For this reason we were asked to develop a fast and complete solution to close off all the underwater openings of the vessels including sea chests, overboard valves and box coolers.



Hydrex setting up equipment next to research vessel for blanking operation.

To ensure a smooth operation, a preliminary inspection team was sent to take all the required measurements of the underwater hulls. This allowed our technical department to plan the operation and propose a complete scope of work to the owner.

Once the operation was approved, we mobilized a larger team to the vessels to carry out the plan. One by one the underwater hulls were completely closed off. Between 30 and 40 blanks were installed on each ship, ranging from small 10 x 10 cm plates up to very large 4 x 4 meter ones.



Certified wet welder preparing sea chest for blanking.



Hydrex certified dry welder preparing one of the larger blanks for installation.

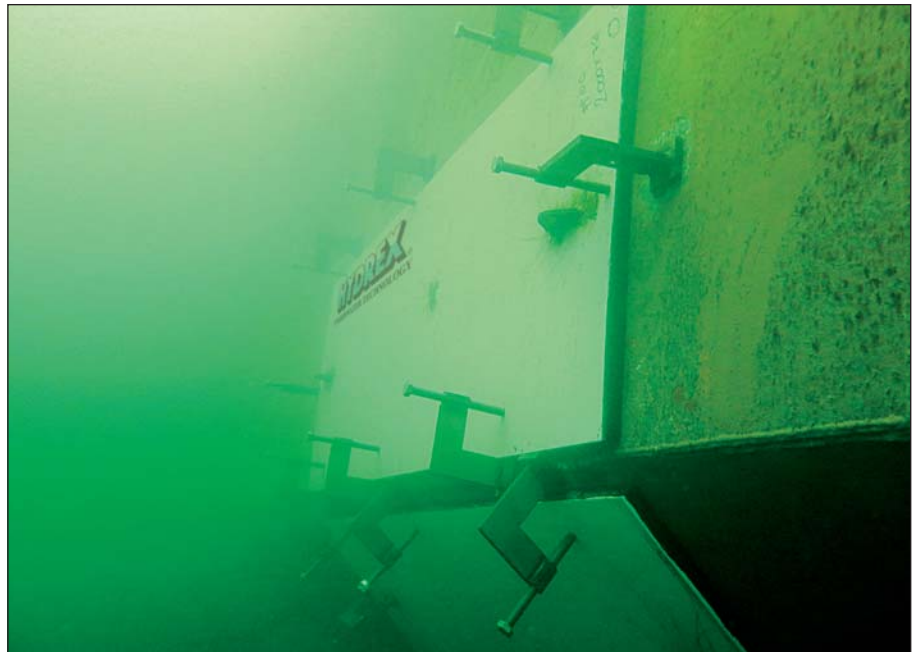
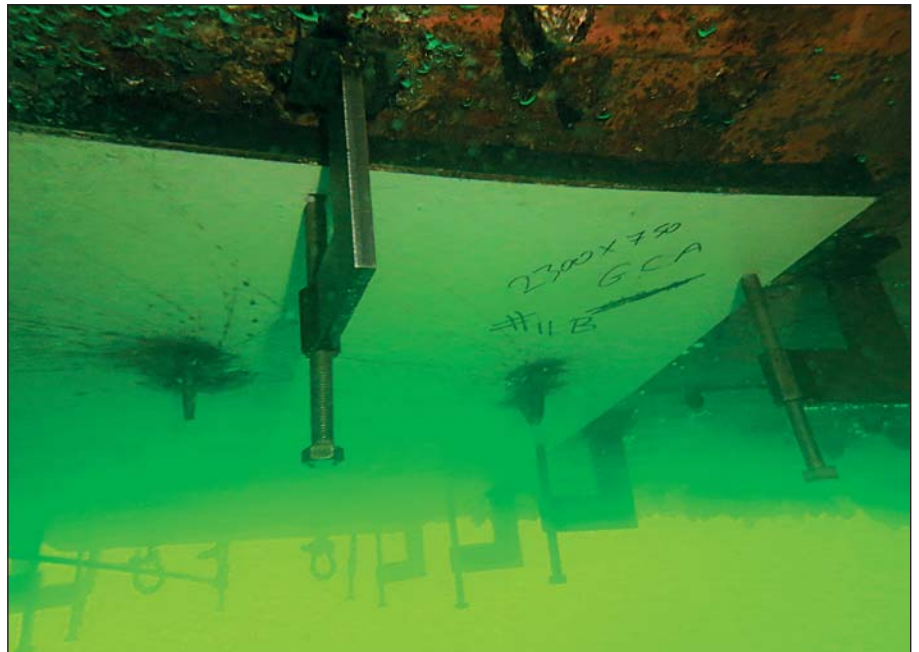
Permanent in-water rudder repairs now possible without drydocking



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.



Blanks in a wide variety of shapes and sizes were installed on the four vessels.



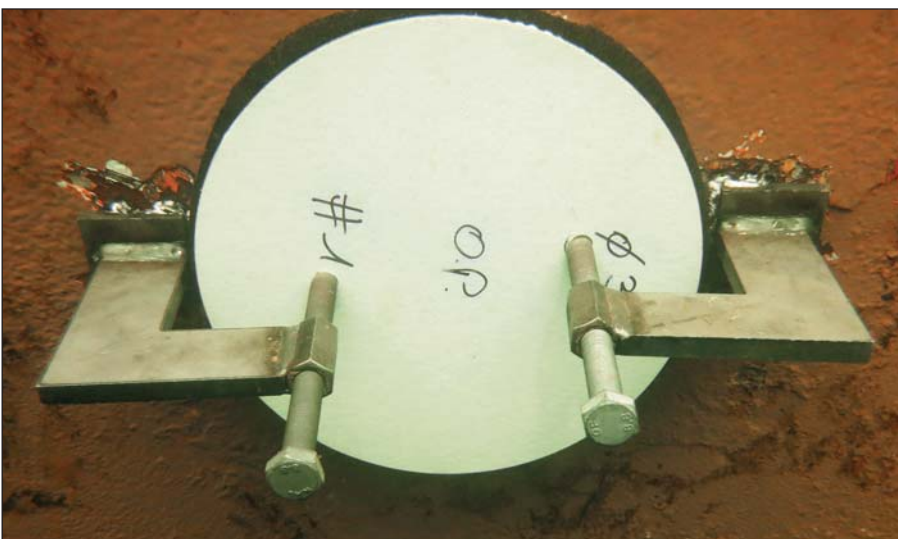
Lowering one of the blanks into the water.



Hydrex diver suiting up for underwater operation.



Diver/technician during welding work on one of the research vessels.



One of the overboards being closed off.

Conclusion

By blanking the underwater openings of these vessels, the owner's assets are kept safe during this cold stacking period.

If you should ever have to take one or more vessels out of service for a longer period of time, we can also assist you with the removal of thrusters, echo sounders and speed logs or a survey of the current state of the hull.

After an evaluation we can quickly advise you on the scope of work. We will give you a fast and clear answer to your questions and help you get your vessel(s) taken care of.

You can count on us. ■

**KEEPING SHIPS
IN BUSINESS**

Swift on-site bow thruster operations



The Hydrex 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 them 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.



UNDERWATER TECHNOLOGY

Phone: + 32 3 213 5300 (24/7)

Fax: + 32 3 213 5321

hydrex@hydrex.be

www.hydrex.be



Afloat propeller operations in ARA-region

Recently Hydrex diver/technicians carried out afloat propeller operations on vessels in Belgium and the Netherlands. In Antwerp the damaged blades of a 190-meter roro vessel were cropped, while in Amsterdam and Rotterdam the propeller blades of two 229-meter bulkers were modified to allow the ships to save fuel while sailing at lower RPM.

When damage to propellers occurs due to impact with ice and other debris, Hydrex will help you, even if the damage is quite extensive.

A ship with bent or cracked propeller blades might experience severe vibrations while sailing. The classification society might demand a repair before the vessel is allowed to sail on. By straightening the blades or cropping them, Hydrex can re-



Hydrex workboat and equipment next to a roro vessel in Antwerp.

store the propeller's balance, resulting in a green light from the class for the vessel.

A propeller modification can easily be combined with any other maintenance or repair operation that needs to be carried out on the vessel. Thanks to the flexibility of the Hydrex teams impact on a sailing schedule can be minimized.

In the following case study cropping was the only option as the damage to the propeller blades was too great to allow cold straightening. This kind of repair is carried out with the propeller blade cutting equipment developed by the Hydrex research department.

Overnight cropping in Antwerp

Three of the five blades of a roro vessel were severely bent, with one of these blades bent at an angle of 70°. An on-site solution was needed to restore the propeller's balance and



Diver/technician measuring one of the cropped pieces of blade.



Testing one of the modified blades in Amsterdam for cracks.



Modification of one of the blades of a bulker in Amsterdam.



The propellers of two bulkers were modified to save fuel.

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 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.

HYDREX
UNDERWATER TECHNOLOGY



Grinding the edge of a modified propeller blade as per specifications.

efficiency. A team was therefore mobilized from our headquarters in Antwerp to the ship's location.

After the equipment arrived the team started the operation with a detailed survey of the complete propeller. The team then used the information acquired during the inspection to calculate and determine the correct cutting line needed to modify the trailing edges of the blades and remove the damage. Next the divers cropped the blades and ground their edges to give them the correct shape. The two undamaged blades also needed to be cropped using the exact same cutting line to give the propeller back its balance.

When the cropping was complete, the Hydrex technicians buffed the blades to make sure that any re-

Hydrex US ready to mobilize immediately

Hydrex has an office located in Clearwater in the Tampa Bay area that is ready to mobilize immediately. The office has a fast response center that is equipped with an extensive range of state of the art logistics, trucks, tools and diving support equipment. This enables Hydrex US to efficiently service vessels and offshore units calling on ports in Canada, North, Central and South America as well as the Caribbean.

All staff members of the Hydrex office in Clearwater undergo stringent training at the Hydrex headquarters in Antwerp. They can carry out both simple and complex high quality jobs even in the harshest of circumstances.



Repairs to thrusters, propellers, rudders, stern tube seals, damaged or corroded hulls and all other underwater repair as well as maintenance services are done while the vessel is afloat. This eliminates the need to drydock.

All used methods are fully approved by all major classification societies.

HYDREX
UNDERWATER TECHNOLOGY



Modified propeller blade of bulker in Rotterdam.

maintaining loss of efficiency would be minimal.

Blade modification does not need to wait until drydock

We do not only offers repair services, but can also help customers when they have the need for preventive or other special custom projects.

A good example of this is the project that was carried out recently on two sister vessels. These 229-meter bulkers were going to sail at a lower RPM. A modification of the propeller blades' diameter would allow them to save fuel while doing this.

We mobilized a team to carry out the modifications while the ships were

afloat. One operation was done in Rotterdam, the other in Amsterdam, but in both cases they were performed without disrupting cargo operations.

Another example are the preventive modifications that we made in Bremerhaven to the blades of three ice-going vessels. This was done by modifying the blades to a very specific design that made them less prone to damage while keeping the performance of the propeller as close to optimum as possible. The operation was performed in close communication with the manufacturer of the propellers.

Conclusion

Over forty years of experience with propeller repairs have given us the tools and know how to offer fast repair and modification services to vessels around the world. All types of operations can be carried out fast, fluently and efficiently afloat and underwater. ■



The propeller blades of two bulkers were modified to save fuel.

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

Hydrex offers turnkey underwater repair solutions to ship-owners wherever and whenever they are needed. Hydrex's multi-disciplinary team will help you find the best solution for any problem encountered with your ship below the water line. We will immediately mobilize our diver/technicians to carry out necessary repair work without the need to drydock.

Hydrex has a long track record of

performing complex permanent underwater repairs to thrusters, propellers, rudders, stern tube seals and damaged or corroded hulls. By creating drydock-like conditions around the affected area, our diver/technicians can carry out these operations in port or at anchor.

All the projects we undertake are engineered and carried out in close cooperation with the customer and any third party suppliers, relieving

the customer of all the hassle of coordination, planning and supervision.

Headquartered in the Belgian port of Antwerp, we have offices in Rotterdam, Tampa (U.S.A) and Algeciras (Spain).

All Hydrex offices have fully operational fast response centers where an extensive range of state-of-the-art equipment is available at all times.



Headquarters Hydrex N.V. - Antwerp

Phone: + 32 3 213 5300 (24/7)

E-mail: hydrex@hydrex.be

Hydrex Rotterdam

Phone: +31 10 313 25 19 (24/7)

E-mail: info@hydrex.nl

Hydrex Spain - Algeciras

Phone: + 34 (956) 675 049 (24/7)

E-mail: info@hydrex.es

Hydrex LLC - Tampa, U.S.A.

Phone: + 1 727 443 3900 (24/7)

E-mail: info@hydrex.us

www.hydrex.be