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KEEPING SHIPS IN BUSINESS

ISO 9001 certified

Underwater services and
technology approved by:



Reduce your fuel bill by 10% now without going to drydock



There are two simple, easy and inexpensive steps that together can save you 10% of your fuel costs.

Propeller buffing is a new technique developed and delivered by Hydrex to keep your propeller in optimum condition. This is not conventional propeller polishing. Routine propeller buffing can save you 5% of your fuel bill, is very easy to schedule and carry out regularly, starting just as soon as you want to save 5% of your ship or fleet's propulsive fuel costs. This offers extraordinary Return on Investment (ROI) in terms of instant fuel savings. Very low outlay for very high returns and an extremely rapid payback.

Propeller boss cap fins (PBCF) can be installed by Hydrex divers anywhere, any time. This device is custom made for your ship's propeller. It can save an additional 5% of your fuel costs. There is a lead time of a couple of months for the PBCF to be made for your ship but Hydrex can install your new PBCF as soon as it's ready and you can start saving an additional 5% of your fuel bill immediately.

**HYDREX PROPELLER
BUFFING + PBCFs =
10% PROPULSIVE
FUEL SAVINGS**

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UNDERWATER TECHNOLOGY

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Underwater bow thruster blade replacement in Barcelona keeps ship out of drydock

Earlier this month Hydrex carried out bow thruster blade replacements on a 270-meter container ship in Barcelona. A condition of class was issued after cracks were detected in the old blades, forcing the vessel to go off hire until a solution was found. Hydrex therefore mobilized a team to Barcelona and performed the operation on-site and underwater using the company's flexible mob-docks.

As soon as our technical department received the call from the owner, a team and all the required equipment

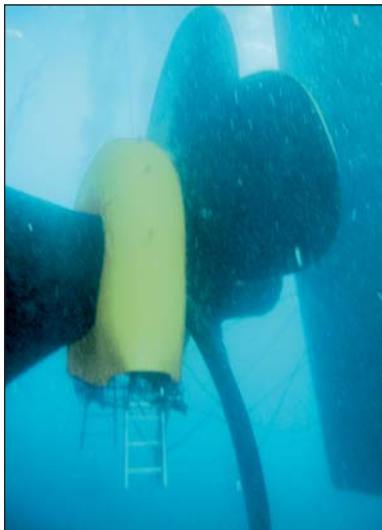


Hydrex diving station during bow thruster operation in Barcelona.



Hydrex truck and equipment next to container vessel.

Underwater stern tube seal repairs with new generation flexible mobdocks



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 top specialist suppliers.

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.

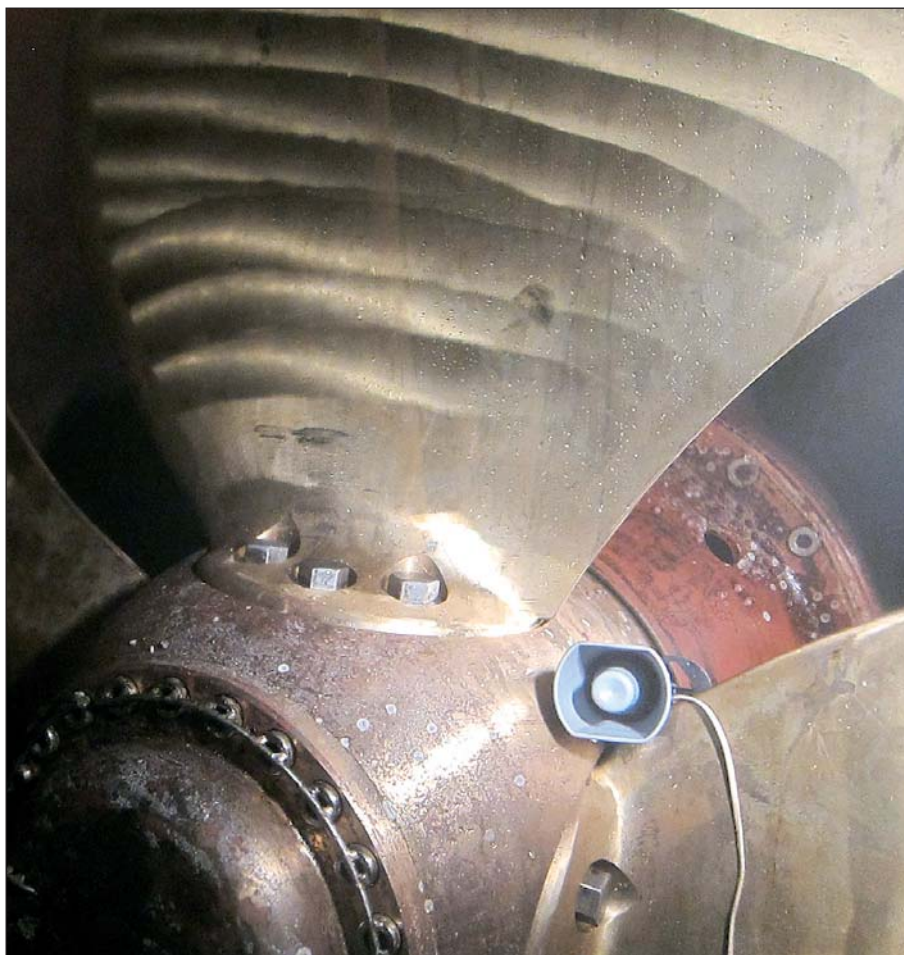
Visit the special stern tube seal repair section on our website for more information and examples of the many seal repairs we have performed in recent years.



Lifting one of the old thruster blades inside the closed off thruster tunnel.



Hydrex diver during thruster blade removal.



Thruster unit with new blades installed.

was mobilized to the vessel's location. When the diver/technicians arrived, the replacement blades were on board the container vessel. The new blades were prepared for installation while the rest of the Hydrex team readied the bow thruster tunnel for the operation.

The Hydrex flexible mobdocks were then installed on both sides of the thruster tunnel. Next the team could evacuate all water from the tunnel. In this manner a dry working environment was created.

The diver/technicians then removed the first blade of the bow thruster. They brought it to the surface. Next a replacement blade was lowered into the water and taken to the thruster tunnel. The team positioned the new blade on the bow thruster and bolted it on. This procedure was repeated for the other blades.

After the blades had been replaced they were put on torque. Leakage tests were carried out successfully and the divers removed the flexible mobdocks.

During the replacements the superintendent of the vessel was present. He followed the operation and gave his approval.

Summary

The Hydrex team worked in shifts around the clock to finish the job as soon as possible. By performing the operation on-site and underwater, Hydrex made it possible for the owner to have the condition of class removed without going to drydock. ■

New generation cold straightening equipment

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.

HYDREX
UNDERWATER TECHNOLOGY

High quality in-water ship rep

Permanent insert repairs

Specialist class approved insert repair work carried out and on a permanent basis. Providing a real alternative to drydock.

Emergency repairs

Fast response emergency repairs worldwide.

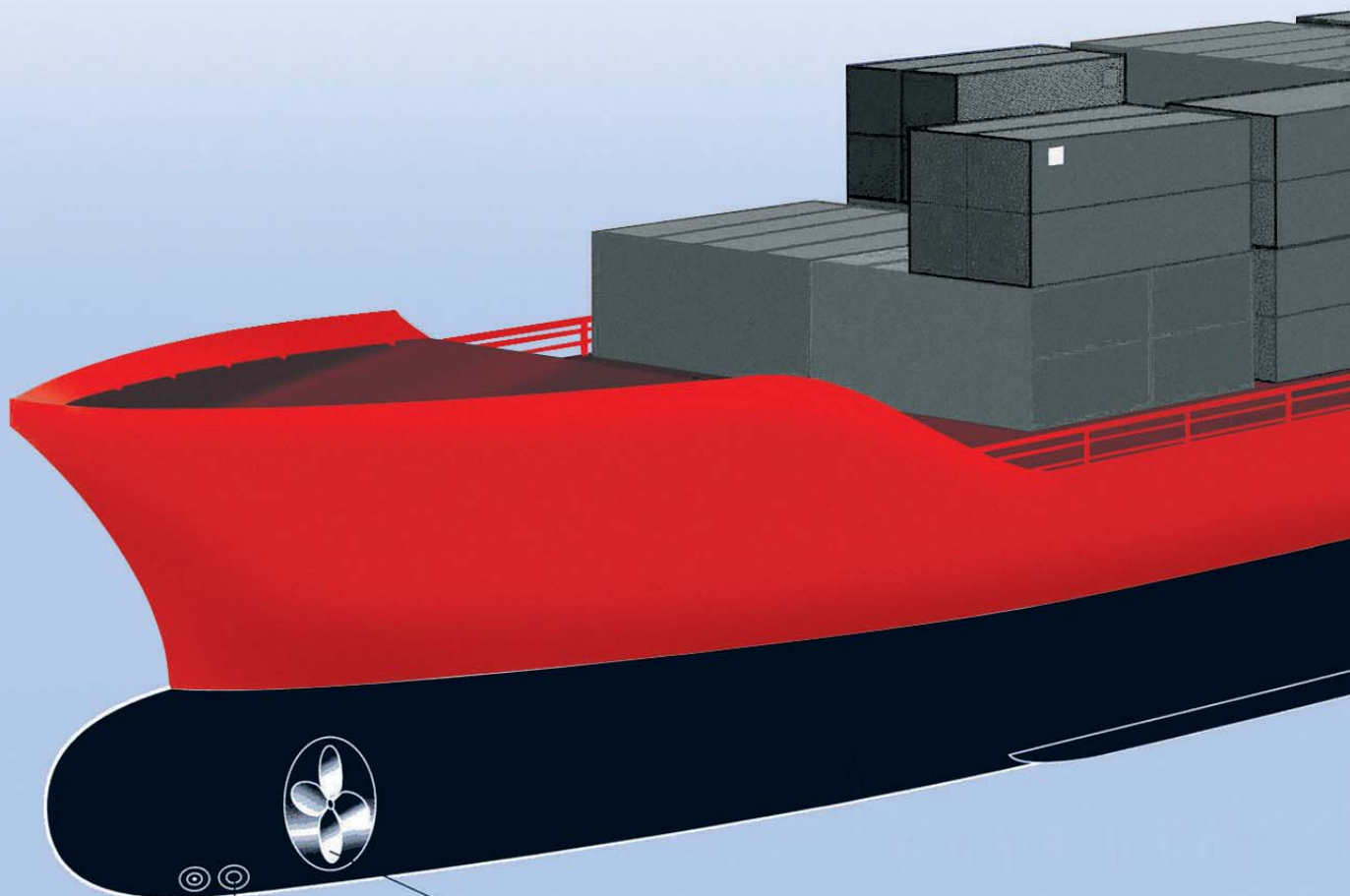
Inwater video inspections

Professional video surveys provide a reality of the problem and enable owners and classification surveyors to directly diagnose any problems.

Echo sounder inspection and replacement

Speed log
Checks for damage and marine fouling.

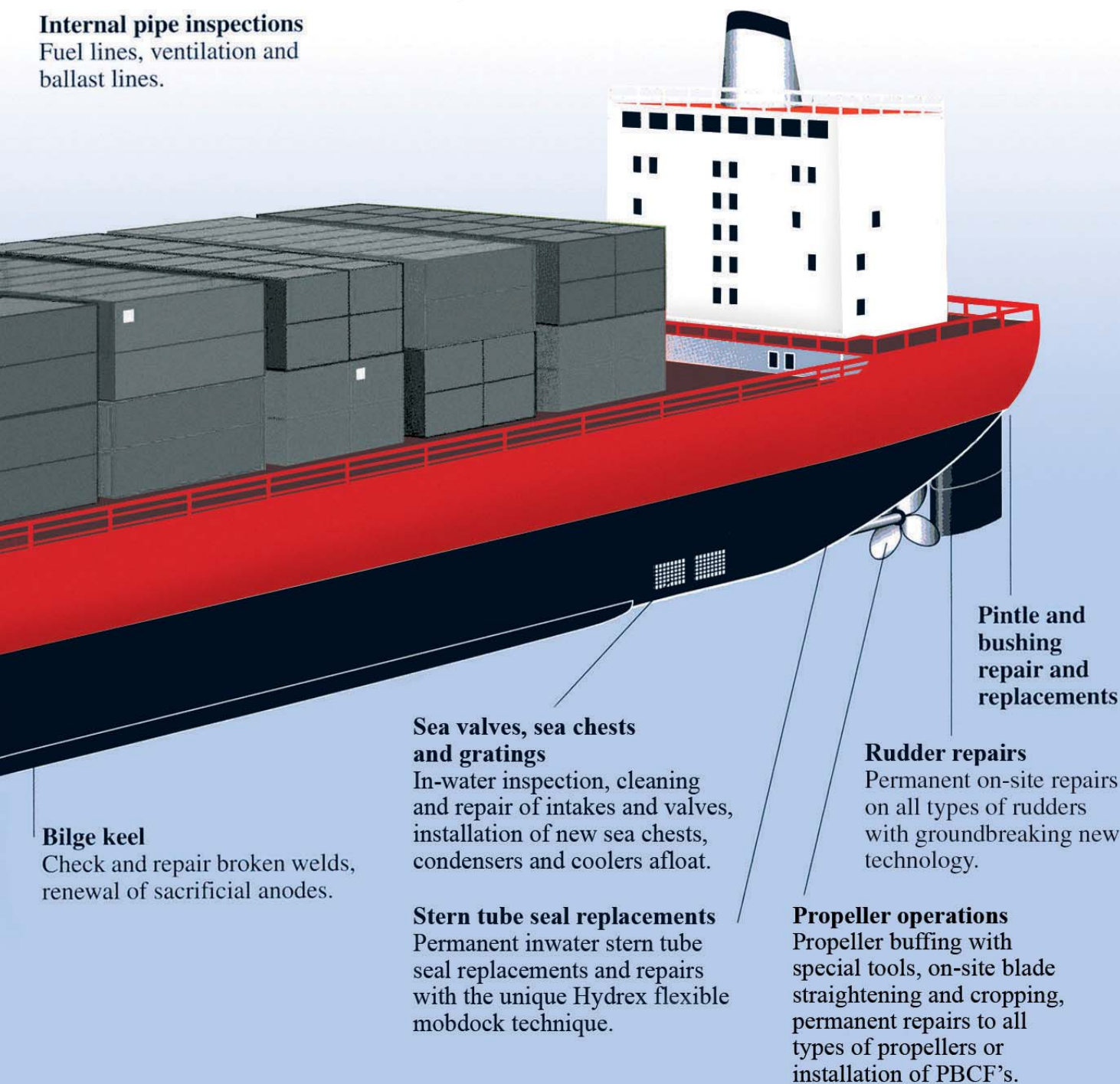
Bow thruster and propellers
Permanent on-site repair, maintenance and replacement with the award winning flexible mobdock technique.



air and maintenance services

Internal pipe inspections

Fuel lines, ventilation and ballast lines.



KEEPING SHIPS IN BUSINESS

Hydrex performs emergency rudder operation in Scotland

Shortly after a 101-meter ferry left drydock, its rudder started showing wrong readings. An underwater inspection uncovered that the rudder was not calibrated correctly and that its movements did not match the readings. An emergency underwater operation was needed. For this reason Hydrex mobilized a diver/technician team to the vessel to carry out the repair in Ullapool, Scotland.

After arriving on site, the Hydrex team performed a detailed underwater inspection of the rudder. This revealed that the rudder stock was severely damaged, making it impossible to readjust the rudder. In consultation with the classification society and the manufacturer, it was decided that removing the rudder was the only option.

The Hydrex divers then secured the 5 ton unit with chain blocks and carefully lowered the rudder. It was then lifted ashore to be inspected. Because the necessary repairs could not be done on-site, going back to drydock was required. The rudder was therefore transported to Liverpool where it would be repaired and waiting to be reinstalled on the ferry when it came into dock as well.

It was unfortunate that the vessel had to go back to drydock so soon, but thanks to the Hydrex team the owner and the representatives of the manufacturer and the classification society could get a full reality of the damage. This allowed them to make an informed decision regarding the



The rudder was secured with chain blocks and then slowly lowered.

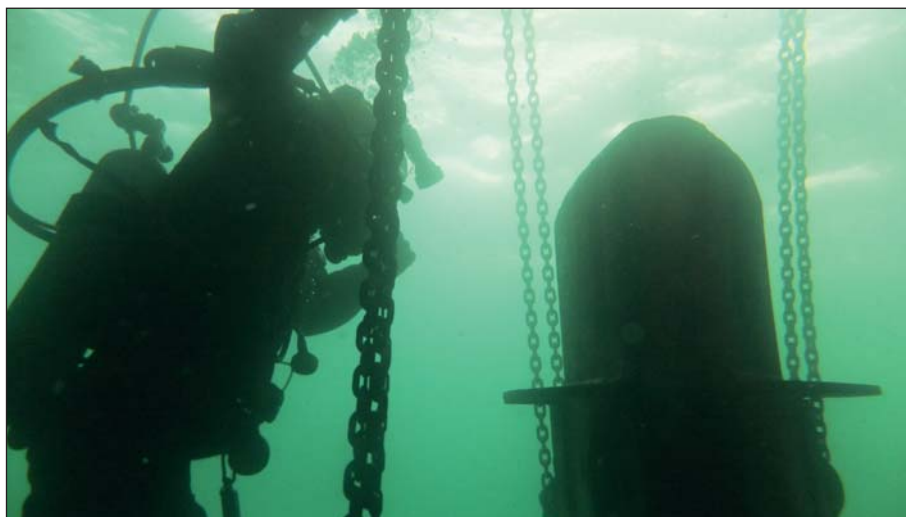


Hydrex diver/technician preparing the rudder for the next phase of the removal.

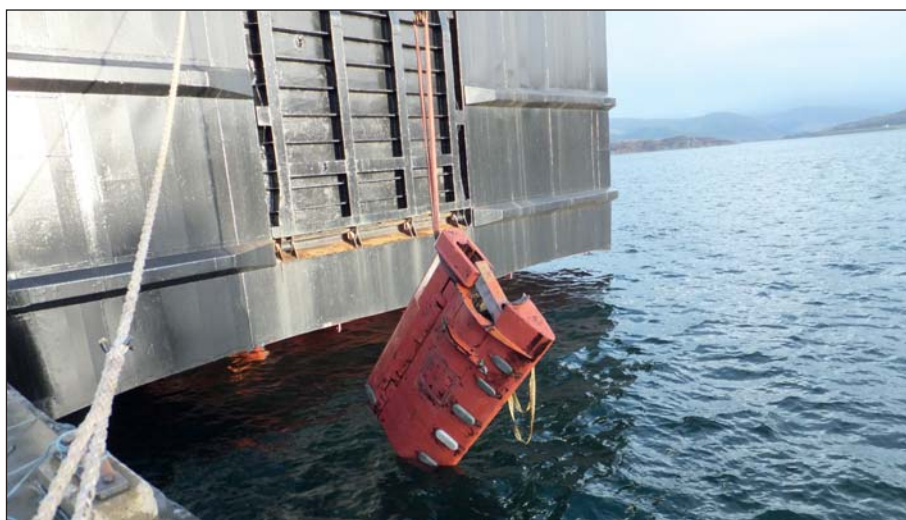
best solution for the problem. At the time of writing, the ferry has left drydock and is safely sailing between the Scottish ports of Stornoway and Ullapool again. ■

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



Hydrex diver during the rudder removal.



The rudder was brought on shore for further inspection by the manufacturer.

**KEEPING SHIPS
IN BUSINESS**

Fuel savings from underwater PBCF installation in Rotterdam

Last month Hydrex installed Propeller Boss Cap Fins (PBCF) on a 183-meter tanker during the vessel's stop in Rotterdam. As a result of the underwater operation, the ship will not have to wait for the next drydock visit to start benefitting from the fuel savings the PBCF will bring.

The Propeller Boss Cap Fins (PBCF) is a device for propeller efficiency improvement developed by Mitsui O. S. K. Lines, Ltd. The PBCF can recover energy loss of a propeller hub vortex in the propeller's backward flow. This decreases fuel consumption by 5% when operating at the same speed, or boosts speed by 2% with the same fuel consumption.

The 5% energy saving effect has been verified by world research institutes including International



Hydrex workboat approaching tanker during PBCF operation.

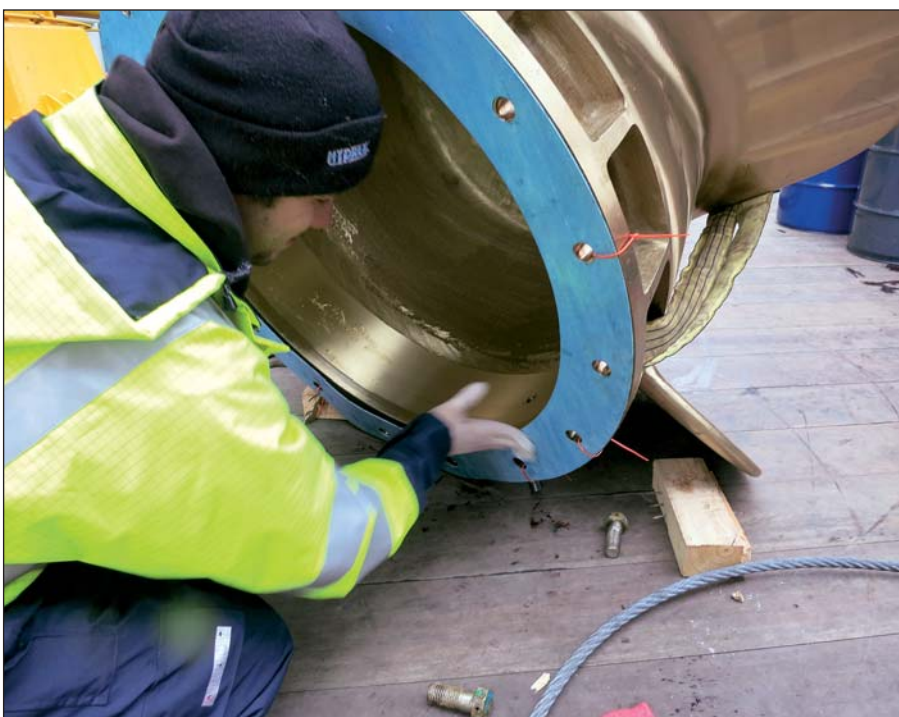
Towing Tank Conferences (ITTC) and by owners.

With the current emphasis on global environment problems, the demand for the PBCF has been continually

growing both as an energy saving device and an environment-friendly product because it realizes a 5% reduction in CO₂, NO_x and SO_x emission from vessels.

On-site installation prevents a long wait for fuel saving benefits

After the Hydrex team arrived at the vessel's location with one of the company's workboats, they started the underwater operation with a full inspection of the propeller. Next the diver/technicians removed the propeller cap and cleaned the area where the spinner cone was to be installed. They then lowered the PBCF into the water and positioned it on the propeller. When this was done, grease was inserted in the space underneath the propeller cone for lubrication and the bolts were torqued and secured with wire, finishing the installation of the PBCF. The Hydrex team worked



Hydrex technician preparing PBCF for installation.



PBCF lifted from Hydrex workboat, ready to be installed.



Hydrex diver/technician preparing the propeller for the operation.

around the clock to finish the operation as quickly as possible.

By performing the operation on-site and underwater, the owner of the tanker could immediately start enjoying the fuel savings the system offers. Otherwise he would have had to wait for the next scheduled dry-

docking to have the PBCF's installed. This would have lost him up to two years of fuel savings. Calculations show that he will have earned back the money of the underwater installation in about eight weeks, so the savings for the customer are substantial. ■

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 much time and money.

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 for a wide range of actions.

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
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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 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.



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