

# HYDREX<sup>®</sup>

## UNDERWATER TECHNOLOGY

Magazine

Number 279



<b>Underwater bow thruster removal in Rotterdam .....</b>	<b>4</b>
<b>Ready to work throughout the port of Rotterdam .....</b>	<b>8</b>
<b>Permanent underwater insert repair on tanker in Amsterdam .....</b>	<b>10</b>
<b>Fast repairs in Spain and France put a spin on propeller cropping .....</b>	<b>12</b>
<b>Large fuel savings with new propeller surface treatment technique .....</b>	<b>14</b>

# Hydrex is looking for representative agents



**T**o support our continuous growth, we are expanding our worldwide network of Hydrex agents. This allows us to reach a much bigger public directly than would otherwise be possible.

All our offices have fully operational fast response centers where an extensive range of state-of-the-

art equipment is available at all times for immediate deployment with our skilled diver/technician teams to wherever they are needed.

The services that we offer are highly specialized underwater and in water repairs. These include bow thruster repairs and replacements, stern tube seal repairs, hull shell plating repairs and replacements, in water surveys

and various maintenance work. More information on our services can be found on our website.

Contact us if you are interested in joining our network and help us build a strong relationship with our prospects and customers. We look forward to hearing from you.



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# Editorial



**W**hen we send a team to an operation, any operation, we have one goal in mind: to get the job done in the shortest possible time and to the highest standards. This has been our policy since Hydrex was founded in 1974. Our track record proves that this is not a false claim.

Keeping a ship in business is a very complex task that does not end at the close of an office day. For this reason we are available 24/7 to assist you with all things concerning your vessel's underwater hull, whether great or small, emergencies or long term projects. All operations will be adapted to your vessel's sailing schedule, not the other way around.

Our teams will take care of the entire underwater part of your vessel and this all around the world. If you leave the care of your vessel's underwater hull to us, you do not have to worry about it anymore and can focus again on other important matters.

Hydrex founder  
Boud Van Rompay  
bvr@hydrex.be

## Table of contents



Underwater bow thruster removal in Rotterdam 4-5



Ready to work throughout the port of Rotterdam 8-9



Permanent underwater insert repair on tanker in Amsterdam 10-11



Fast repairs in Spain and France put a spin on propeller cropping 12-13



Large fuel savings with new propeller surface treatment technique 14

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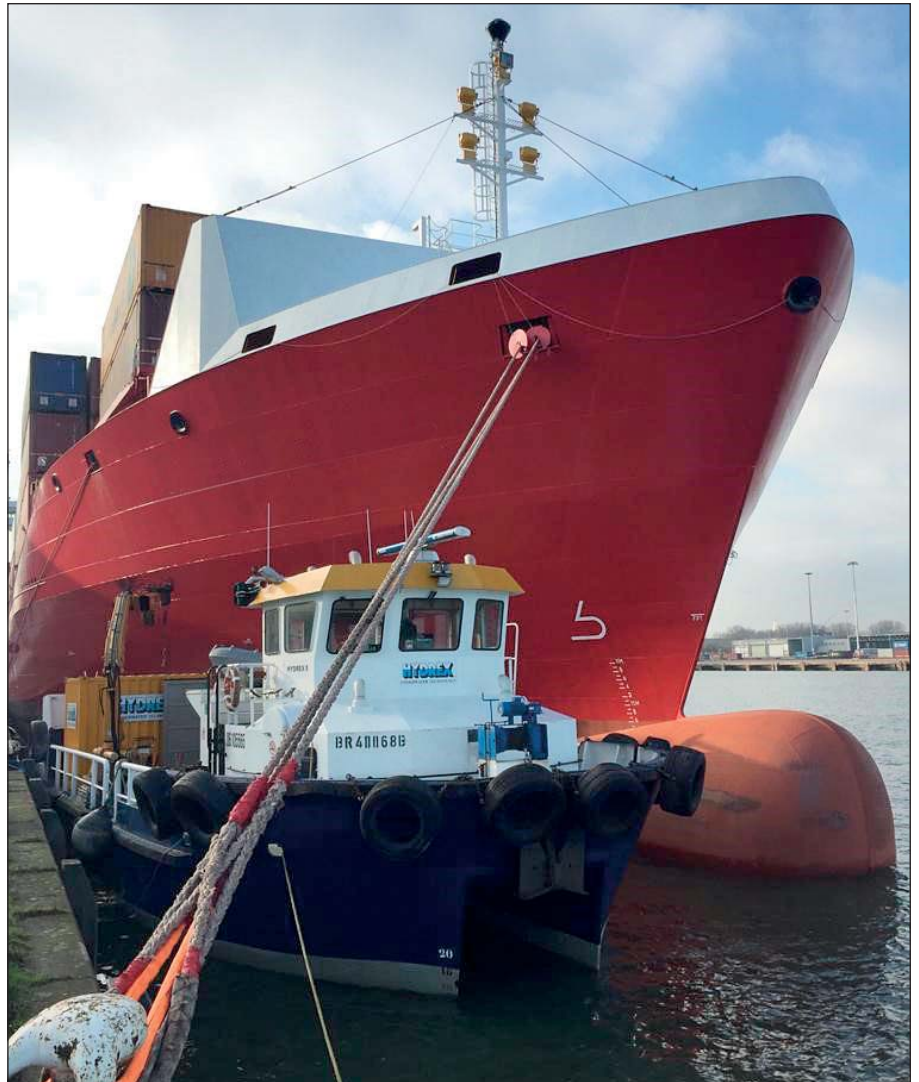
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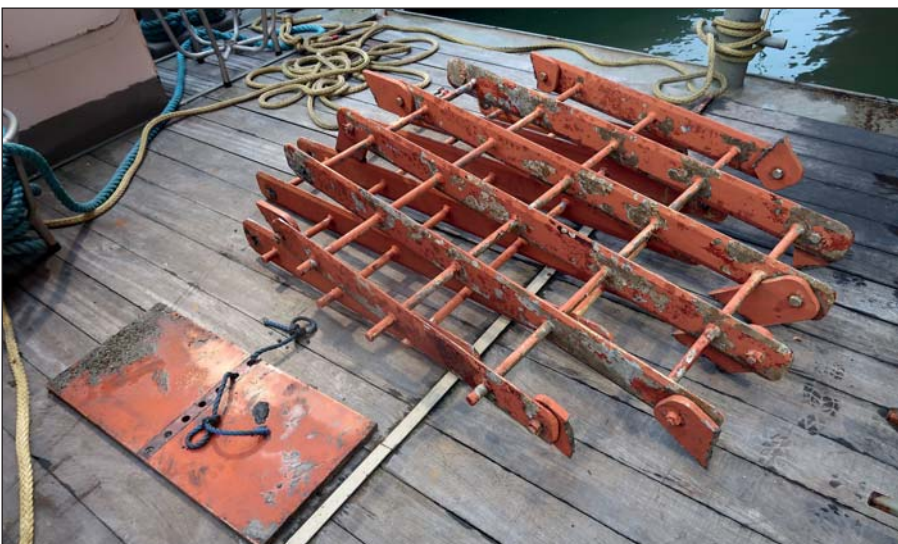
# Underwater bow thruster removal in Rotterdam

**L**ast month one of our teams removed a bow thruster from a 170-meter container ship. This was done during a stop in Rotterdam. The unit needed to be overhauled and the operation had to be carried out within a very short window that would fit the schedule available to the vessel's owner

The team mobilized to the ship's location using one of our workboats loaded with all the needed equipment. These workboats are fully equipped as dive support stations with hydraulic cranes, winches, nautical and communication equipment and a dive control room. They are stationed in Antwerp and Rotterdam and can be used for a wide range of operations in Belgium, the Netherlands, the United Kingdom and France. This enables rapid deployment. It also increases flexibility, which was essential during an operation like this.



*Hydrex workboat next to container ship in Rotterdam.*

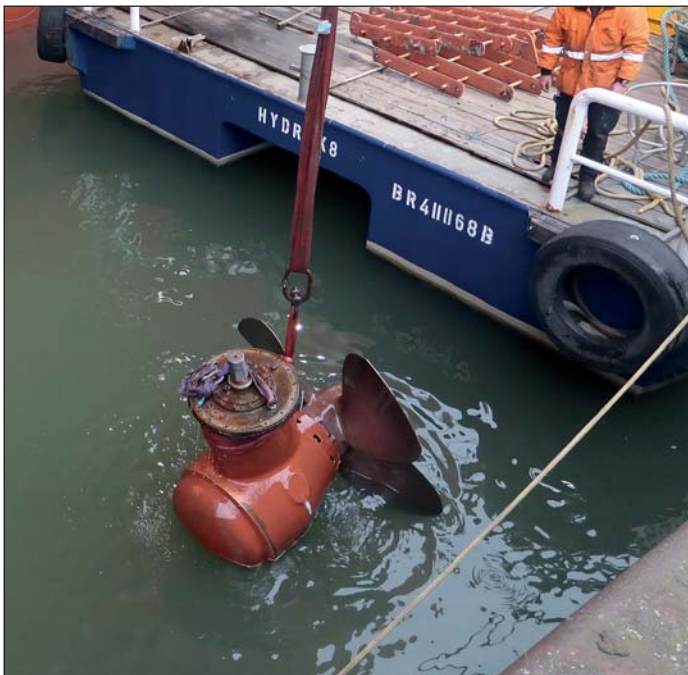


*The grids were removed to enable our team to access the thruster tunnel.*

After the team set up a monitoring station, the divers started the operation with a detailed inspection of the bow thruster and tunnel. In the meantime, initial preparations were made in the bow thruster engine room for the removal of the unit so that there would be no ingress of water once it was taken out.

The next step was to secure the gearbox with hoisting equipment. The team then disconnected the unit from the engine room. They lowered it onto a sledge designed





*Thruster lifted out of the water and onto the quay.*



*The thruster was removed without having to detach the blades.*



*Inspection of the thruster prior to transportation to the workshop.*

especially for such thruster operations.

We carried out the removal following the specific procedures required by the involved OEM. This allowed us to remove the thruster unit with the blades still attached, speeding up the operation.

Simultaneously the team sealed off the tunnel from the bow thruster room. Once the unit was lifted onto the quay it was prepared for transport to the workshop.

## Conclusion

By performing the operation on-site and underwater our divers made it possible for the owner to keep the vessel out of drydock.

Our team worked in shifts around the clock. They finished the job well within the available time frame. This allowed the ship to sail on schedule, which was a key benefit for the owner. ■



# Bow thruster repairs adapted to your ship's schedule

**H**ydrex can perform bow thruster removals and re-installations on all types of tunnel thrusters. These repairs are carried out in cooperation with OEMs on any location. They are performed while the vessel stays afloat without impact on its schedule.

Tunnel thruster operations are carried out using our flexible mobdocks that close off the tunnel on both sides. This allows divers to work in a dry environment around the unit.



*One of our divers getting ready during the night shift.*



*One of our divers guiding the unit to the surface.*



*The unit after the removal, ready to be overhauled.*

Our range of flexible mobdocks can quickly be transported to any location around the world.

In most cases a thruster overhaul is planned in during a scheduled drydocking. This usually means that the unit is removed in drydock. The ship then has to wait for the overhauled thruster to return and be reinstalled before the vessel can leave drydock. This results in a longer drydock time and consequent cost. Our teams can however remove the unit while the ship is still afloat so it can already be brought to the manufacturer for the overhaul. When the vessel enters drydock the overhauled unit is ready for reinstallation without any delay.

The reverse procedure is also possible. If the thruster is removed in drydock, we can reinstall it underwater in dry conditions at a later date. In this way the ship can already leave drydock while the unit is still with the manufacturer.





*Hydrex diver during the reconnection of the thruster to the engine room.*



*Hydrex technician inside a closed-off thruster tunnel.*

Please contact us for more information on bow thruster or other underwater repairs. We are at your disposal 24/7. ■

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**KEEPING SHIPS  
IN BUSINESS**



# Ready to work throughout the port of Rotterdam

**T**o enable a fast mobilization throughout the entire Rotterdam port without delaying a ship's commercial operations, Hydrex dive support vessels are stationed in Rotterdam. These workboats are fully equipped with hydraulic cranes, winches, a dive spread and control room.

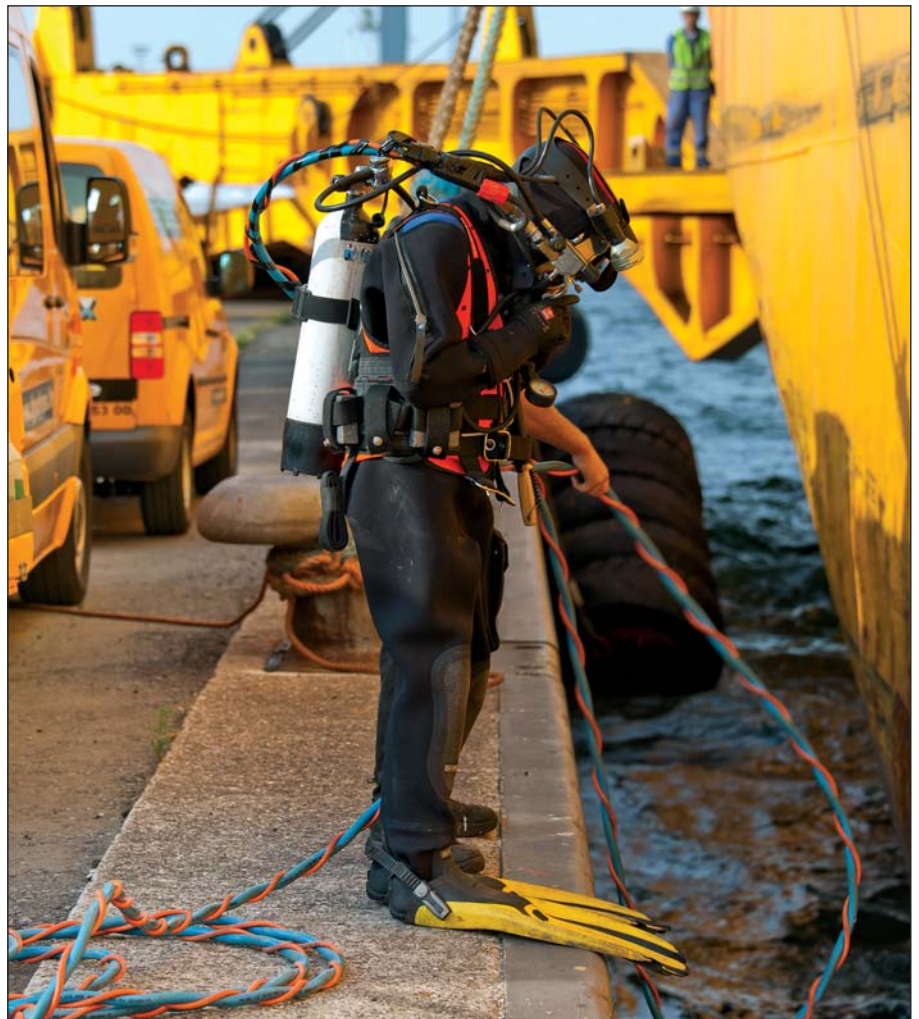
This allows us to offer simple maintenance operations as well as repairs on all parts of the underwater ship propulsion system and the hull. Hydrex operations are class approved and carried out alongside or at anchorage while commercial activities continue without disruption. We do this with qualified and experienced diver/technicians, state-of-the-art equipment and advanced techniques that create drydock-like conditions underwater.

We have been active in Rotterdam since Hydrex was founded 45 years ago. Examples of recent operations in the port are the bow thruster removal we write about in the first article in this magazine and a stern tube seal repair performed on a ro-ro ship.

Another good example of how we can assist you is a technique called propeller buffing. Keeping a propeller in its optimum shape will give you an instant increase in fuel efficiency, resulting in savings on your fuel bill. By using this method on a regular basis, we are able to obtain this result. You can find more information on this award-winning technique further on in this magazine.



*Fully equipped Hydrex workboat, ideal for a fast mobilization.*



*Our divers can carry out any repair without unnecessary loss of time, quality or safety.*





*Hydrex dive support vessel alongside container vessel in Rotterdam.*



*Diver inside our flexible mobdock during underwater stern tube seal repair in Rotterdam.*

Please feel free to contact us if you would like to have more information on any of our services or if you want to find out how we can assist you and your vessel. ■

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*Our workboats allow us to mobilize throughout the entire port of Antwerp and Rotterdam within hours.*

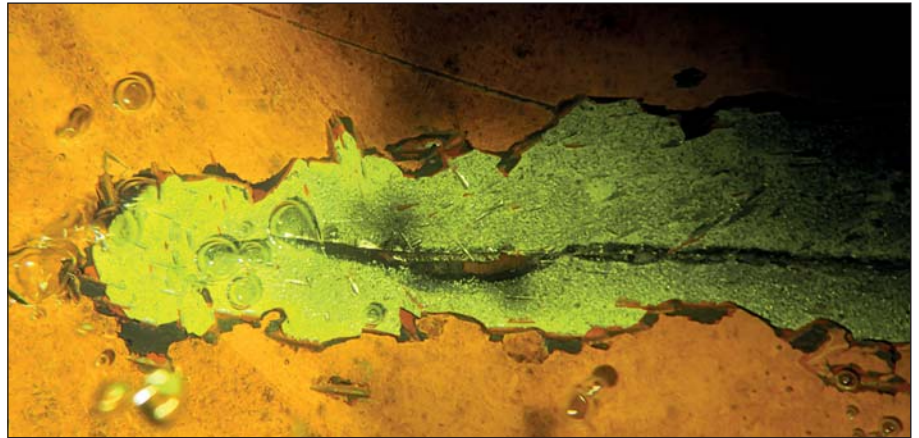


# Permanent underwater insert repair on tanker in Amsterdam

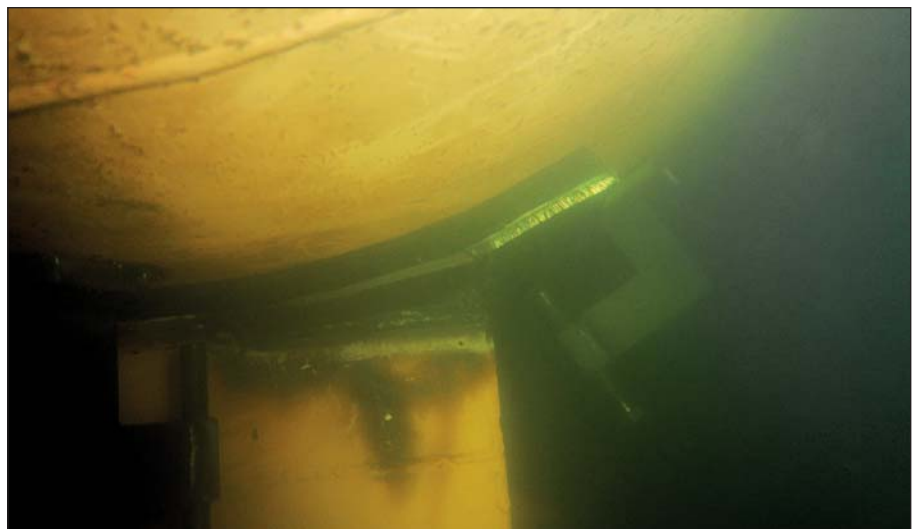
**W**e were contacted to carry out a permanent insert repair on board a 145-meter chemical tanker that had suffered a crack in its port side grey water tank. The work was carried out during the vessel's stop in Amsterdam.

After arriving on site, our team of diver/technicians started with an on-board and underwater inspection of the damaged area. This revealed that the crack was 480 mm long and had split in two at the port side end. In close communication with the superintendent of the vessel and the attending class surveyor, it was decided that a 700 x 300 mm insert would need to be installed.

Our team then used a special frame to take the measurements required to fabricate a mobdock that would perfectly fit the rounded shape of the hull. The steel mobdock and the new insert plate were then fabricated at the Hydrex headquarters in Ant-



*Crack in grey water tank seen from the outside.*



*A special mobdock was constructed that would perfectly fit the shape of the hull.*



*Removal of the damaged area.*

werp. Because our fast-response center is fully stocked at all times, both were ready and at the ship's location very quickly.

After the mobdock had been installed, the frame above the crack was removed by the team. This allowed our diver/technicians to cut away the crack and the surrounding area. The new insert plate was then positioned and welded with full penetration weld following our class-approved procedure.





*Welding the insert.*



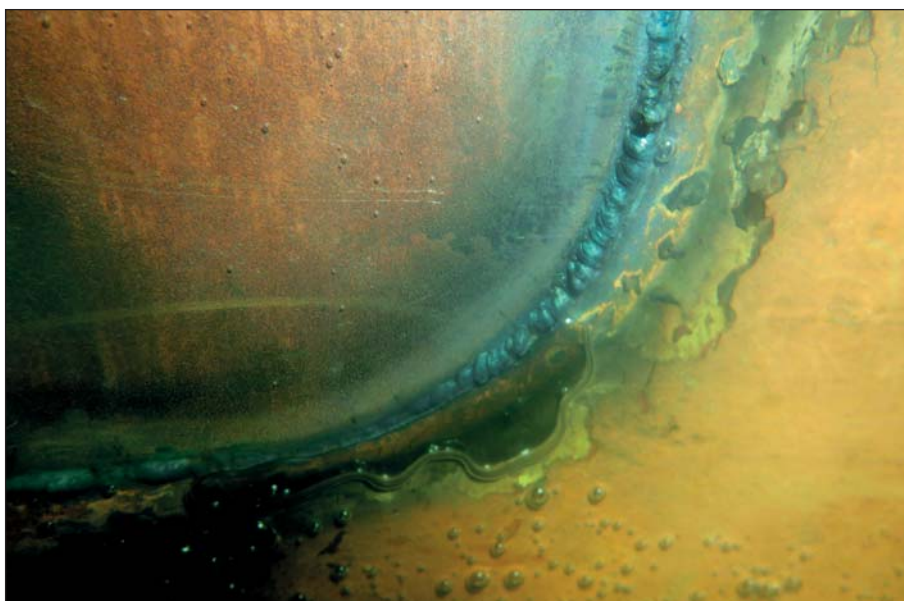
*Insert after full penetration weld.*



*New insert after reinstallation of the frame covering the area.*

An independent NDT inspector approved the insert repair and the classification surveyor who was present during the operation gave his green light. The frame covering the affected area was then reinstalled, concluding the operation.

By removing the large crack and installing a new insert this area of the ship will not require further repairs during her next drydocking. The vessel could sail on time as the repair was carried out well within the stipulated time frame. ■



*Full penetration weld as seen from the outside of the hull.*

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**KEEPING SHIPS  
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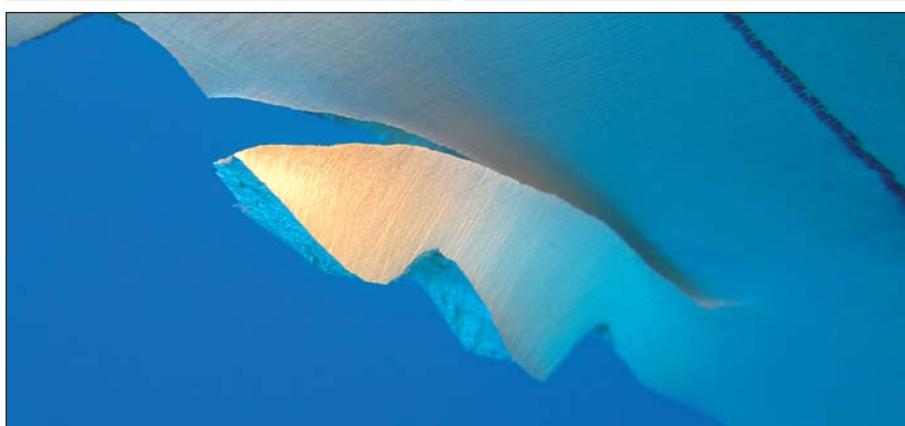
# Fast repairs in Spain and France put a spin on propeller cropping

**T**eams of Hydrex diver/technicians performed propeller blade repairs on bulkcarriers in Spain and France. In Algeciras the four propeller blades of a 170-meter vessel were cropped. A similar operation was carried out on a 229-meter ship during her stay in Dunkirk.

Having developed different procedures for different kinds of damage, Hydrex is equipped and trained to make the best out of a bent or broken propeller. Ideally, the in-house developed cold straightening technique is used. This procedure enables us to straighten damaged



*One of the bent blades of the bulker in Dunkirk.*



*Damaged leading edges of the blades of the vessel in Algeciras.*

blades in-water, allowing commercial operations to continue.

In the following examples 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. In cases where there is an even number of blades an identical piece will be cropped from the opposite blade to restore the hydrodynamic stability of the propeller. By doing so, the best possible efficiency is obtained.

## **Underwater blade cropping in Dunkirk**

The four blades of a 229-meter bulkcarrier's propeller were severely bent. An on-site solution was needed to restore the propeller's balan-





*Hydrex technician cropping one of the blades in France.*



*Hydrex diver grinding the edge of one of the cropped blades.*



*Polishing the cropped blades prevents performance loss.*

ce and efficiency. A team was therefore mobilized to the ship's location to modify the damaged blades.

After the equipment arrived at the vessel's location the team started the operation with a detailed survey of the affected propeller blades. The inspection revealed that the four blades were bent over angles of up to 90 degrees. The team then used the information acquired during the inspection to calculate and determine the correct measurements needed to modify the trailing edges of the propeller blades. Next the divers cropped the blades and ground their edges to give them the correct radius. When the cropping was complete, the Hydrex techni-

cians polished the blades to make sure that any remaining loss of efficiency would be minimal.

### **Fast propeller operation in Algeciras**

The damage to the blades of the 170-meter ship was less severe. It consisted of cracks, cuts and missing chips on the leading edges of the four blades. Despite the relative size of the affected areas, the uneven surface caused a drop in the performance of the propeller. Cropping all four blades was the only way to bring the propeller's workload back to its original level and optimize its performance.

The repair was carried out by a Hydrex diver/technician team mobilized from the close-by office in Algeciras following the same procedure as the operation in Dunkirk.

### **Conclusion**

Both bulkcarriers could continue their schedule without going off-hire to drydock and with the performance of their propellers restored.

Our R&D department is constantly looking into ways to enhance the available propeller repair techniques even further to improve our services. New types of both the straightening and cutting machines have recently been put into service. These allow us to straighten blades that could previously only be cropped and to crop extremely damaged blades with only a minimal loss of efficiency for the propeller. Both types of repairs can be carried out fast, fluently and efficiently on-site and underwater, allowing the ship to return to commercial operations without the need to drydock. ■



# Large fuel savings with new propeller surface treatment technique

**W**e discovered an unsophisticated but very efficient technology to enhance propeller blade surfaces. With this method we can achieve surface conditions that were never seen before. This can only be done underwater.

We have four workboats equipped to deliver this service on a very short notice in the Rhine-Scheldt delta from Antwerp to Rotterdam.

When a comparison is made between the surface condition of an average propeller, as our divers regularly see it, and the smoothness that is obtained with our cleaning technique, savings are in the 5-10% range. These results are easily achieved. The cost of such an operation is very attractive and is very easily gained back in a matter of days (or even hours).



*With our method we can achieve surface conditions never seen before.*

Regular maintenance is easy to schedule and results in ultra-smooth propeller surfaces. Continuous and large fuel savings are now possible.

This award-winning surface treatment technique justifies having the

propeller cleaned every time it calls a port.

Please contact us for more information, we will gladly discuss the benefits of this new technology with you. ■



*Our workboats are equipped to deliver this service at very short notice.*



# Stern tube seal repairs



**U**sing 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 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.



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