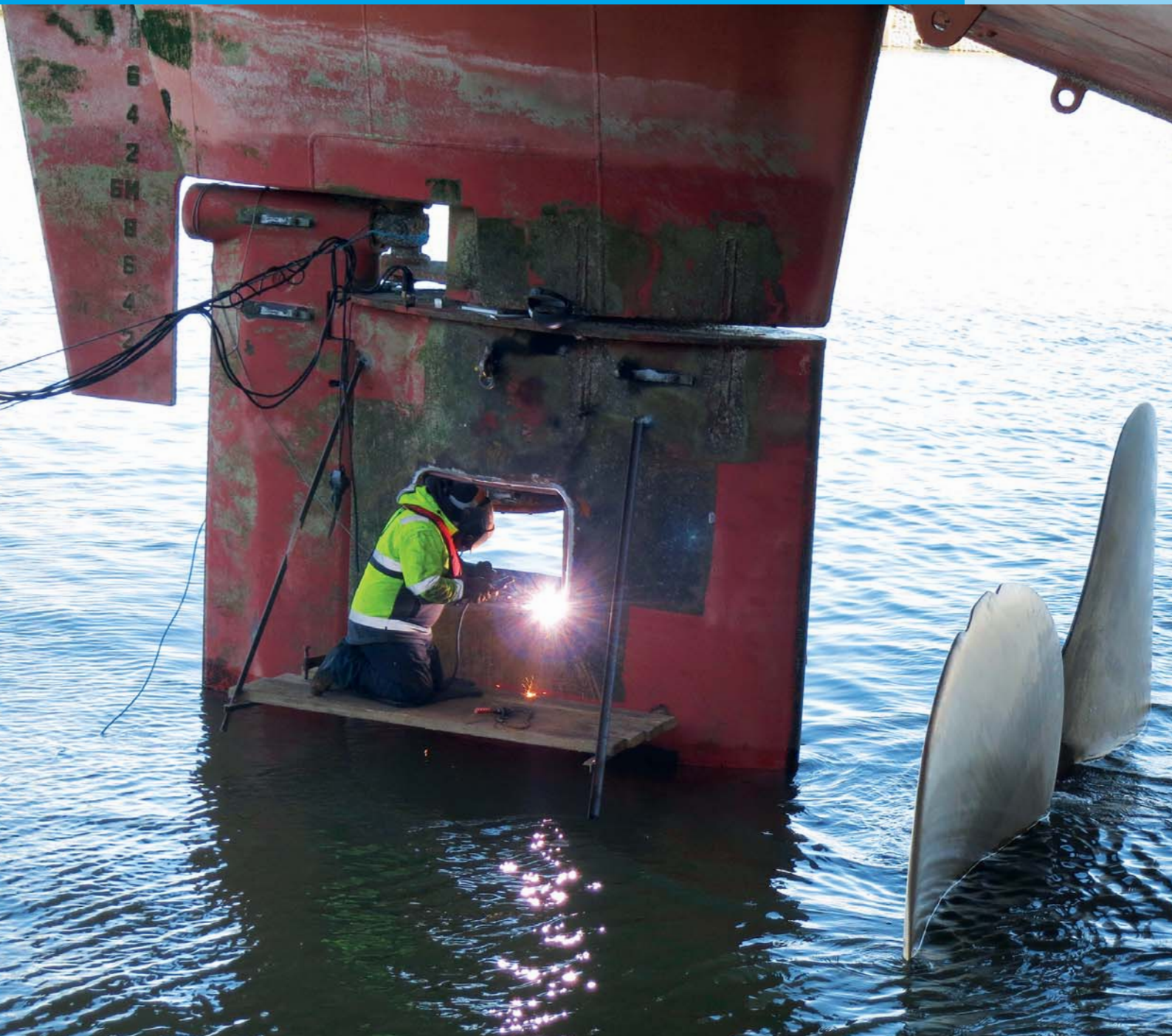




UNDERWATER TECHNOLOGY

Magazine

Number 245



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Hydrex hull repairs save time and money



Hydrex on-site hull repair services include the renewal of both small and large areas of damaged hull plating. These repairs can be carried out above or below water, according to the circumstances, with tailor-made cofferdams. Normal commercial activities can therefore continue without disruption. These operations follow the Hydrex procedure for welding cracks in the vessel's shell plating and they are

approved by all major classification societies.

Hydrex diver/technician teams carry out these on-site hull repairs all over the world. In most cases the damaged area can be replaced with a permanent insert and no condition of class is imposed. On the rare occasions where the damage does not allow such a repair, a temporary doubler plate is installed over the affected area.

This allows the owners to keep to their schedule and have a permanent repair carried out during the next scheduled drydock visit.

To offer the fastest possible service to customers, Hydrex offices have fast response centers where an extensive range of state-of-the-art tools and diving support equipment is available at all times for the repair teams to mobilize to your location.



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Editorial



In the first article in this magazine you can read about a rudder repair operation performed in Rotterdam on a 144-meter tanker. The vessel had suffered cracks in the welding seams of both its rudder cover plates.

The classification society had given the owner a very strict deadline to repair the damage. We offered an underwater solution that allowed the vessel to keep its schedule. The repair was finished well within the available time frame.

An article further on in the magazine deals with the propeller cap repair of three sister ships. On two of these container vessels the old propeller cap had gone missing, breaking off the bolts in the process. The owner asked us to remove the bolts and replace the propeller cap with a new one.

These operations were performed with the same purpose in mind: to keep your vessel out of drydock and get it sailing again as soon as possible.

Hydrex founder
Boud Van Rompay



Cover: Preparing the rudder for installation of the new cover plates.



ISO 9001 certified

Underwater services and
technology approved by:



**BUREAU
VERITAS**

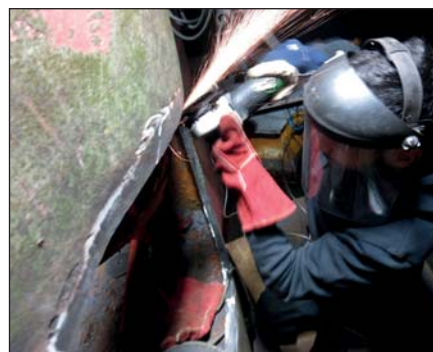


ClassNK

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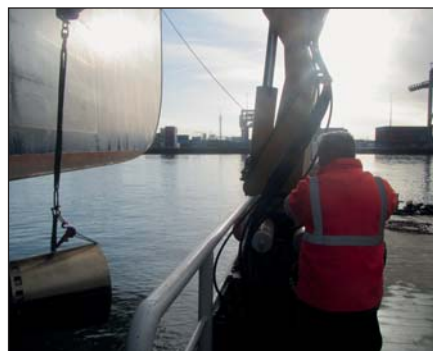
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Rudder cover crack repair in Rotterdam

An underwater inspection revealed cracks in the welding seams of both rudder cover plates of a 144-meter tanker. To prevent the pintle nut from corroding, the classification society demanded that the owner had the damage repaired as soon as possible. When the tanker was on its way to Rotterdam we were contacted to find an on-site solution that would prevent an unscheduled and unwelcome trip to dry-dock.

The classification society had given the owner a very strict deadline. It was therefore essential that our technical department came up with a repair plan that could be carried out very quickly. A diver/technician team immediately mobilized to the vessel's destination so they could start the operation as soon as the ship arrived in Rotterdam.



Hydrex equipment next to tanker in Rotterdam.

Because the tanker was empty, the rudder could be trimmed enough to allow a repair above water. The team first carried out a detailed inspection of the rudder cover plates. This enabled them to make a full assessment

of the damage and communicate the information with our technical department. A dye check of the cracks quickly revealed that the damage of the cover plate welding seams was of such extent that replacing both plates in their entirety was the best option.

The team removed the plates and beveled the edges of the rudder plate to fit the new inserts. In the meantime two new plates were arranged by our technical department. They needed to be the right shape to fit the curve of the rudder perfectly. They were collected from the supplier and cut to the right size in our fast response center where a large stock of equipment is available for emergency repairs as this.

The plates were then transported to the vessel. Our team fit them in the rudder plate and secured them with a full penetration weld. Ultrasonic and



One of the original rudder cover plates after the vessel was trimmed.



A dye check revealed the extend of the cracks.



Preparing the rudder for installation of the new cover plates.



Beveling the edge of the rudder plate to fit the new cover plate.

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.

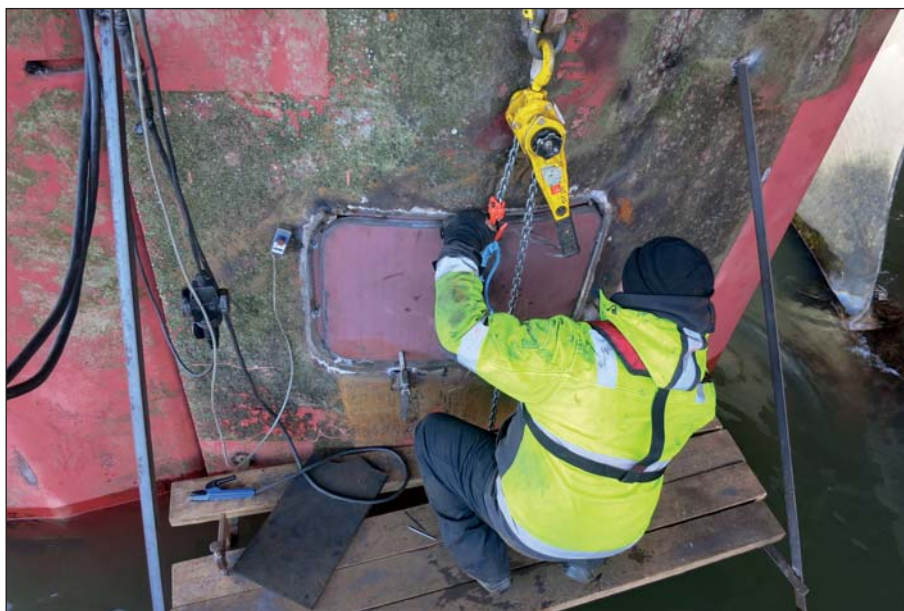
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The new cover plates were arranged by our technical department.

magnetic particles tests were successfully carried out by an independent inspector, finalizing the repair. Seven bolt-on anodes were also installed on each side of the rudder.

The entire operation was supervised and approved by a surveyor of the classification society and the condition of class was lifted. Our team worked in shifts the finish the repair in the shortest possible time. When they left the tanker, the satisfied owner could sail his vessel again without having to worry about costly off-hire time. ■

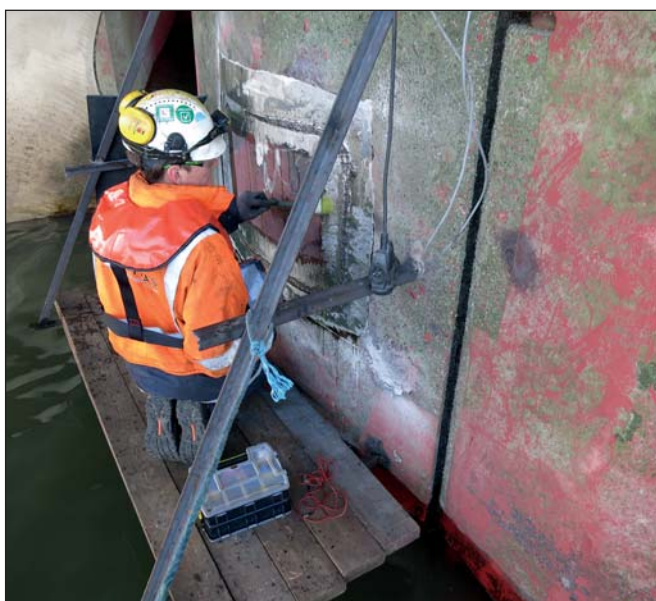


Fitting one of the new cover plates.

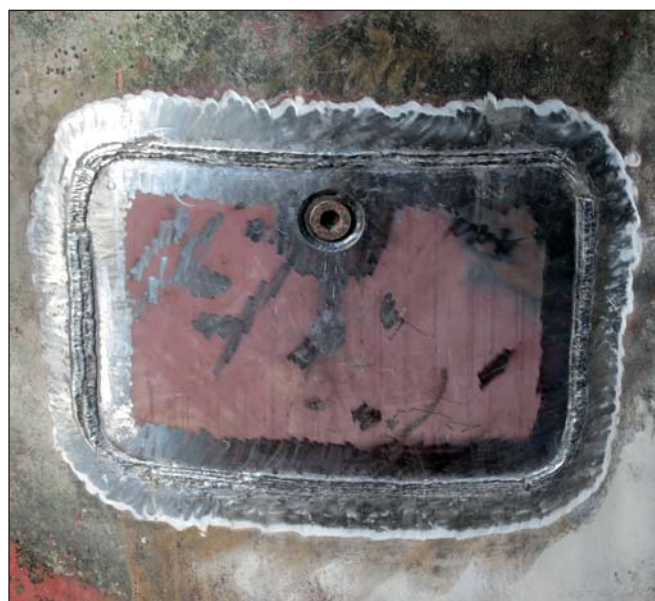
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**KEEPING SHIPS
IN BUSINESS**



Ultrasonic testing by independent inspector.

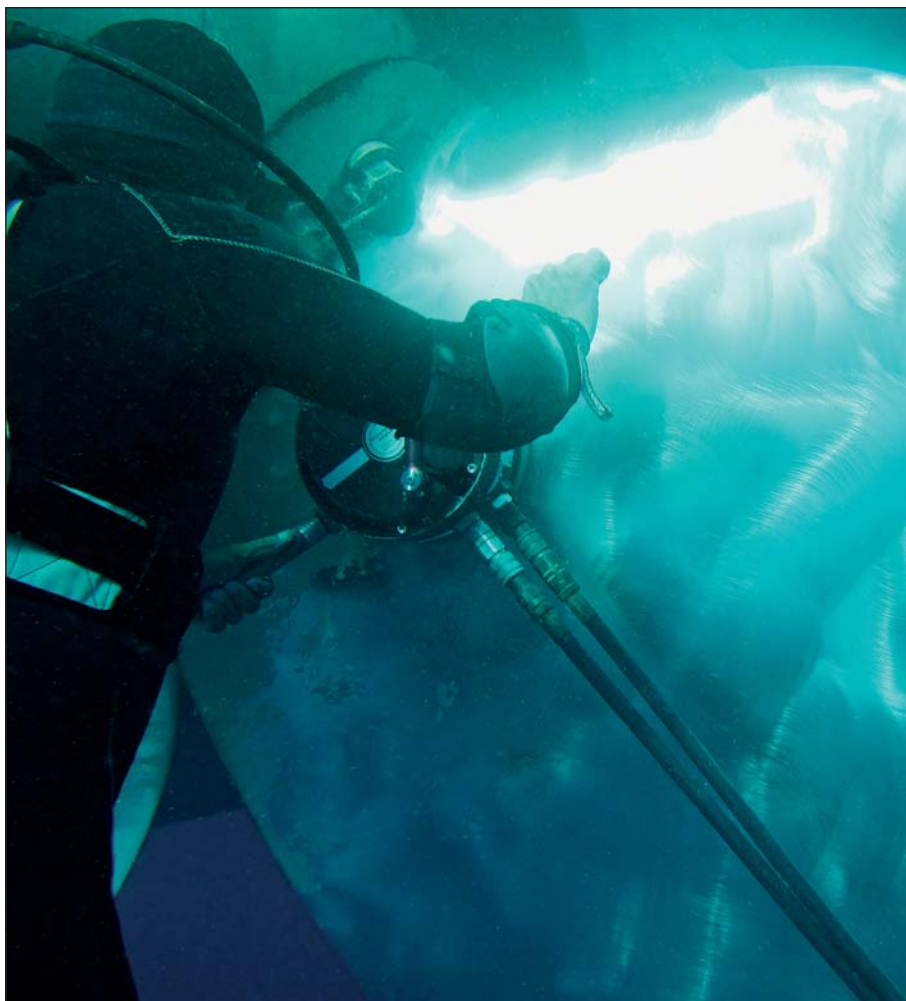


Fully welded new cover plate.

Revolutionary new propeller cleaning technique offers large fuel savings

Hydrex has a new approach to propeller cleaning. The traditional approach in the industry is to let the propeller get good and fouled and build up a calcareous growth and maybe polish it in the water once or twice a year or in drydock. This polishing is done with a grinding disk and can be quite damaging to the propeller. By the very fact of using a grinding disk, a substantial amount of metal is removed from the propeller itself. This can alter the shape and efficiency, cause roughness and increase rather than reduce friction. It can also be a source of marine pollution which is a problem in a number of ports.

Hydrex discovered that more frequent, lighter cleaning of the propeller using a different tool to a grinding disk, and catching the propeller before a calcareous layer builds up is actually the optimum approach to propeller cleaning. If done right and done regularly it can result in 5% or even more fuel savings. Obviously for a ship that has even a medium level of fuel consumption, this savings far outweighs the cost of the propeller cleaning itself. Because the propeller is being cleaned regularly, the cleaning is relatively light and quick. No material is ground away, which is good for the propeller and the environment. The propeller is kept in an ultra-smooth condition (Rubert A or A+) and that's where the real fuel savings can be achieved. This finish can only be accomplished with in-water propeller cleaning.



If done right and done regularly propeller cleaning can result in 5% or even more fuel savings.

Many of our customers who have availed themselves of this service have noticed a remarkable difference in their fuel efficiency after each cleaning.

Thanks to its network of offices and service stations, Hydrex can offer propeller cleanings on a worldwide basis. These operations are carried out using underwater equipment designed and developed in-house specifically for propeller maintenance. Hydrex combines this service with underwater inspections where this is economically advantageous to the shipowner or operator.

We have prepared a full White Paper "Ship Propeller Maintenance: Polish or Clean?" which goes into the subject in detail. It gives the full story. You can download this White Paper at www.shiphullperformance.org.

But even without the White Paper, let us know if you would like to know more about the subject. We would be happy to give you a call to discuss details. ■



High quality in-water ship re

Permanent insert repairs

Specialist class approved insert repair work carried out 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, marine fouling and replacement.

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

Hull cleaning on suitable coatings

Bilge keel
Check and repair broken welds, renewal of sacrificial anodes.

pair and fuel saving services

KEEPING SHIPS IN BUSINESS



Sea valves, sea chests and gratings
In-water inspection, cleaning and repair of intakes and valves, installation of new sea chests, condensers and coolers afloat.

Stern tube seal replacement
Permanent inwater stern tube seal replacements and repairs with the unique Hydrex flexible mobdock technique.

Propeller operations
Propeller cleaning with special tools, on-site blade straightening and cropping. Permanent repairs to all types of propellers or installation of propeller cone fins.

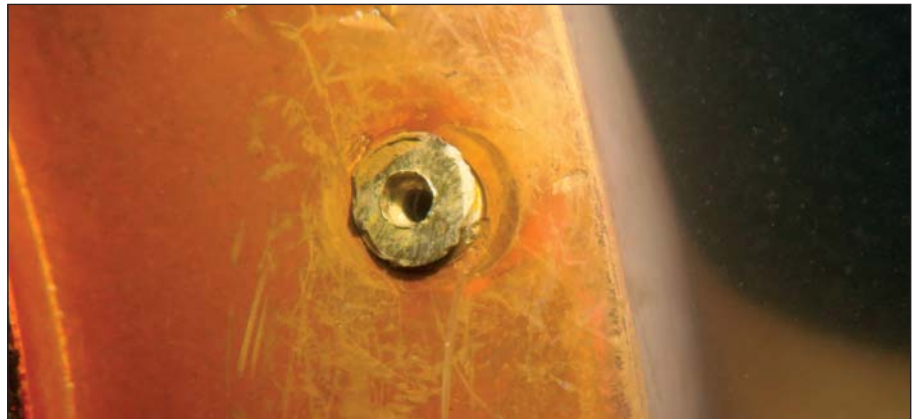
Rudder repairs
Permanent on-site repairs on all types of rudders with groundbreaking new technology.

Pintle and bushing repair and replacements

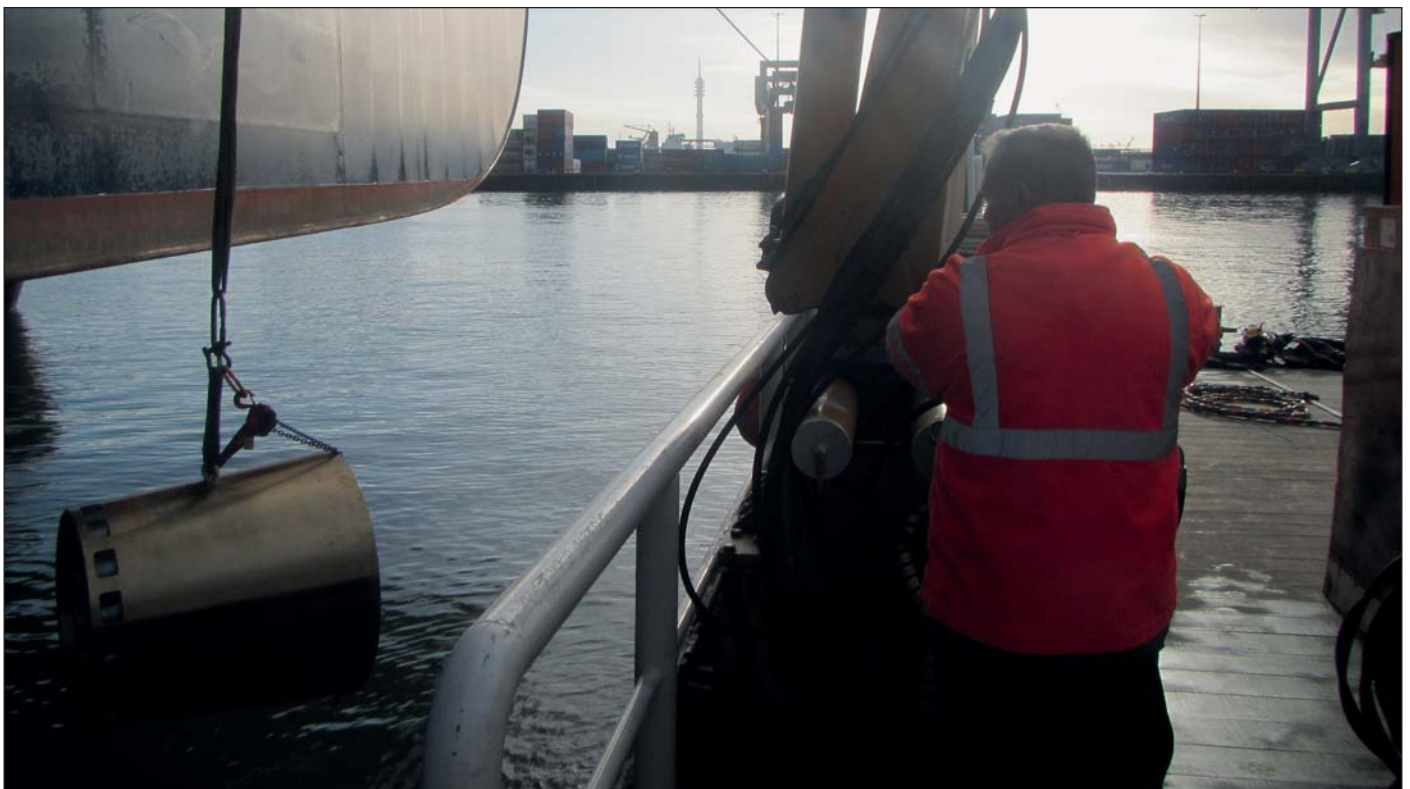
Propeller cap replacement on sister vessels in Rotterdam

A 190-meter container vessel had lost its propeller cap. Because the vessel had been launched only a year earlier, going to drydock was not an option. We were asked to make a full assessment of the damage during the vessel's stay in Algeciras and propose an underwater repair plan that would allow the ship to keep its schedule.

A diver/technician team immediately mobilized to the vessel to carry out a detailed underwater survey of the propeller. This revealed that the bolts that secured the propeller cap had broken off. Before a new cap could be installed the remaining parts of the old bolts needed to be removed.



The propeller cap bolts of the container vessel were broken off.



New propeller cap being lowered into the water.



What was left of the bolts had to be removed carefully to protect the screw thread in the mounting flange.

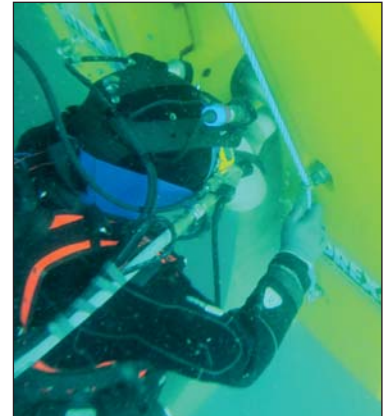


Hydrex diver/technician surfacing after underwater operation in Rotterdam.



New propeller cap ready to be transported from our warehouse to the vessel.

Fast underwater propeller blade straightening



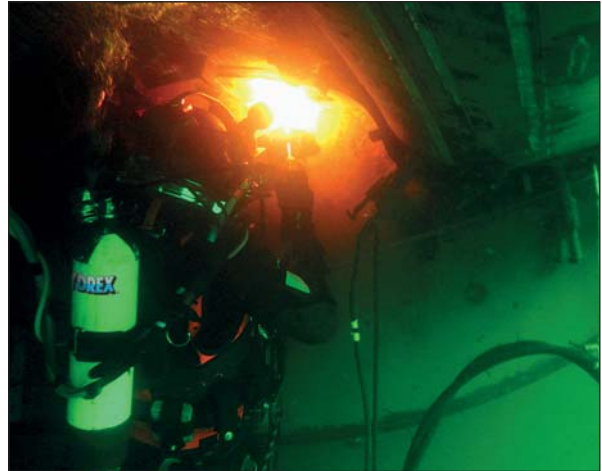
In its quest to provide cost effective services to customers, Hydrex developed procedures to address different kinds of damage to propellers. This research led to the design of the Hydrex cold straightening machines first used in 2002.

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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When your ship has a problem, we'll assess the underwater repair options for free



You need to know your options. Is underwater repair possible? How long would it take? How could it be done?

You can call us any time for an expert assessment, free of charge.

An underwater solution might save you days or even weeks of

lost income. We'll tell you what can and can't be done.

We pretty much wrote the book on underwater repair, and our experience is at your disposal. Our engineering team will give you fast and clear answers to your questions.

Hydrex delivers underwater solu-

tions based on over 40 years of experience, with a long history of pioneering underwater repairs. We'll give you certainty about what is possible while your vessel is afloat.

Do not hesitate to contact us. Our consultation is free and we are ready to help.



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Hydrex workboat next to container vessel in Rotterdam.



The operation was monitored from onboard the dive support workboat.



Preparing a new propeller cap for installation.

It was very important that the screw thread in the mounting flange was not damaged while doing this to allow the securing of new bolts. Because several of the old bolts had been badly deformed this was not a straightforward task. Our diver/technicians are however trained to handle situations like this and they were able to remove the bolts safely.

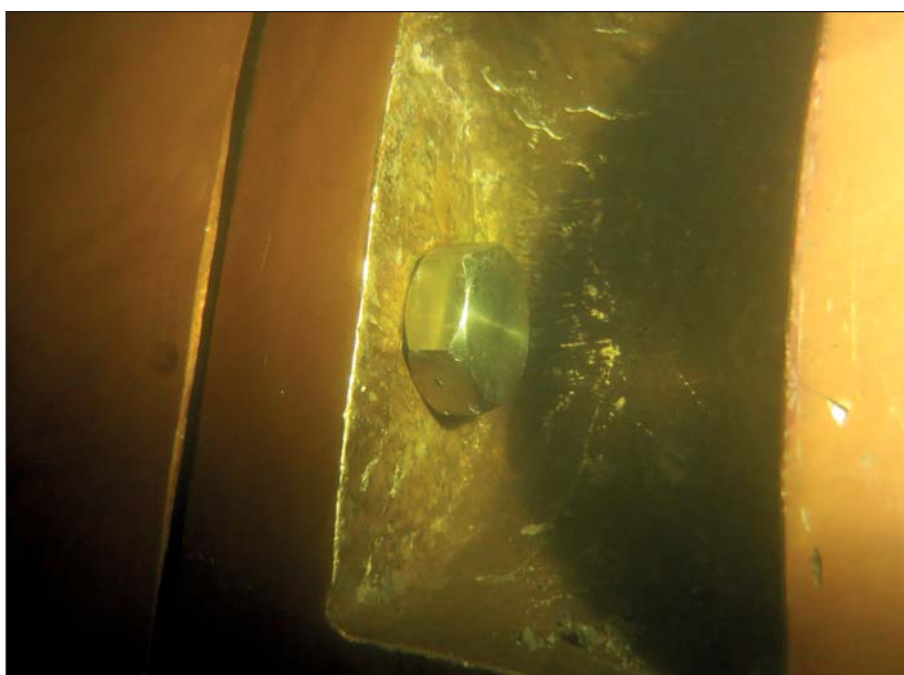
To allow the vessel to keep its schedule it was decided to perform the rest of the operation in Rotterdam during the ship's next stop. At this point our technical department got the request to inspect the propellers of the ship's two sister vessels and if needed to replace their propeller caps as well.

While the ship was on its way to Rotterdam we proposed some adaptations to the propeller cap securing technique, based on our experience with similar operations. This would





Hydrex diver getting ready for underwater operation.



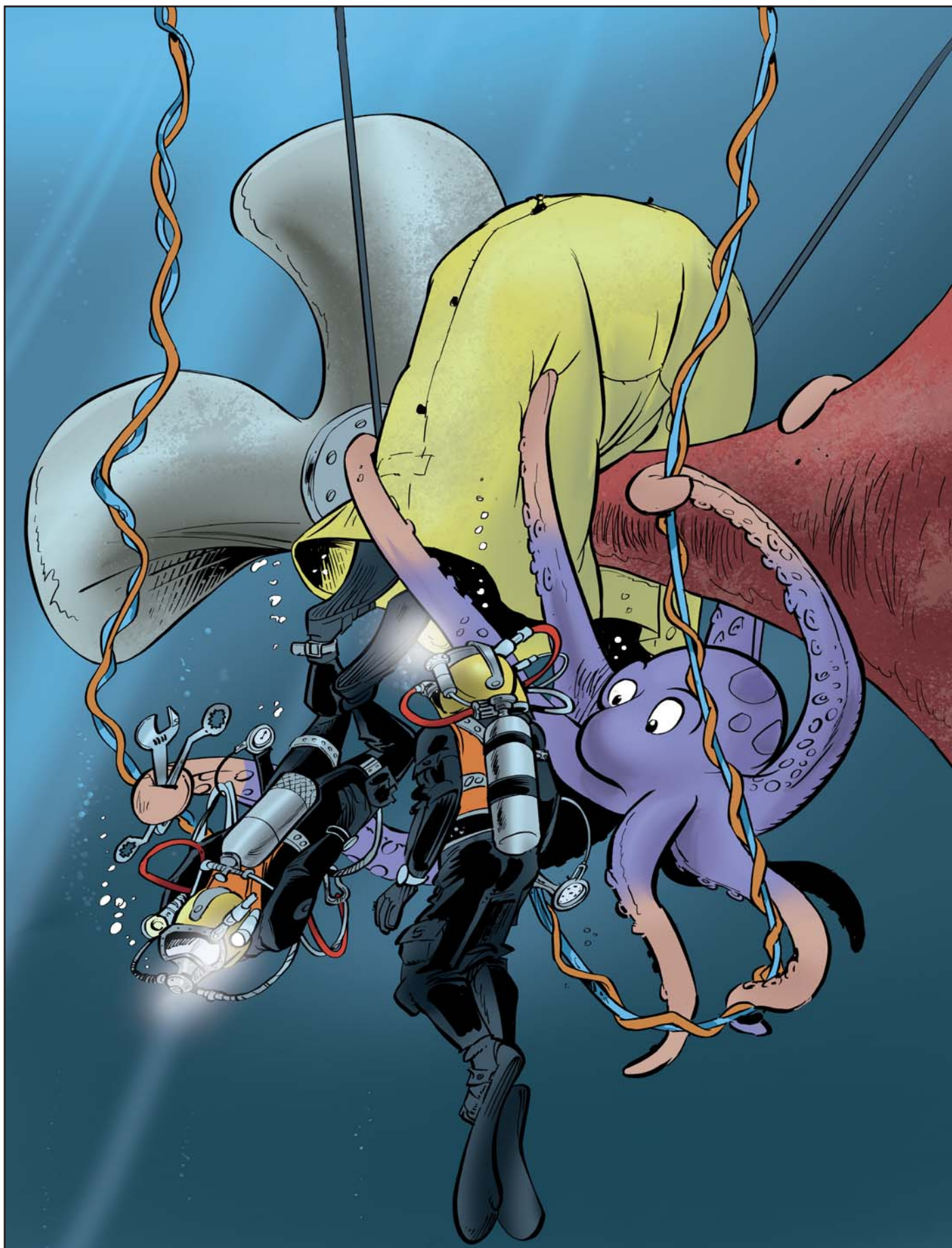
On one of the vessels the existing bolts only needed to be put on torque again.

prevent the problem from reoccurring. Our proposal was accepted by all parties involved.

When the container vessel arrived in port, a team of our diver/technicians mobilized to the ship with one of our workboats. These are fully equipped as dive support stations. The new propeller cap was then quickly installed without any delay to the ship's schedule.

In the next few weeks the vessel's two sister ships were also inspected in Rotterdam by our team. On one of these the propeller cap was still present and all that needed to be done was to check the torque of the bolts. On the third vessel, however, a similar repair as on the first vessel needed to be carried out. Following the same procedure the remainders of the broken bolts were carefully removed and a new propeller cap was installed.

Throughout all stages of these operations our technical department stayed in close communication with all parties involved. Our diver/technicians also worked in shifts to perform the operations in the shortest possible time. As a result of the underwater solution we offered, the owner had the propeller caps replaced while at the same time keeping his vessel on schedule. ■



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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 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.



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