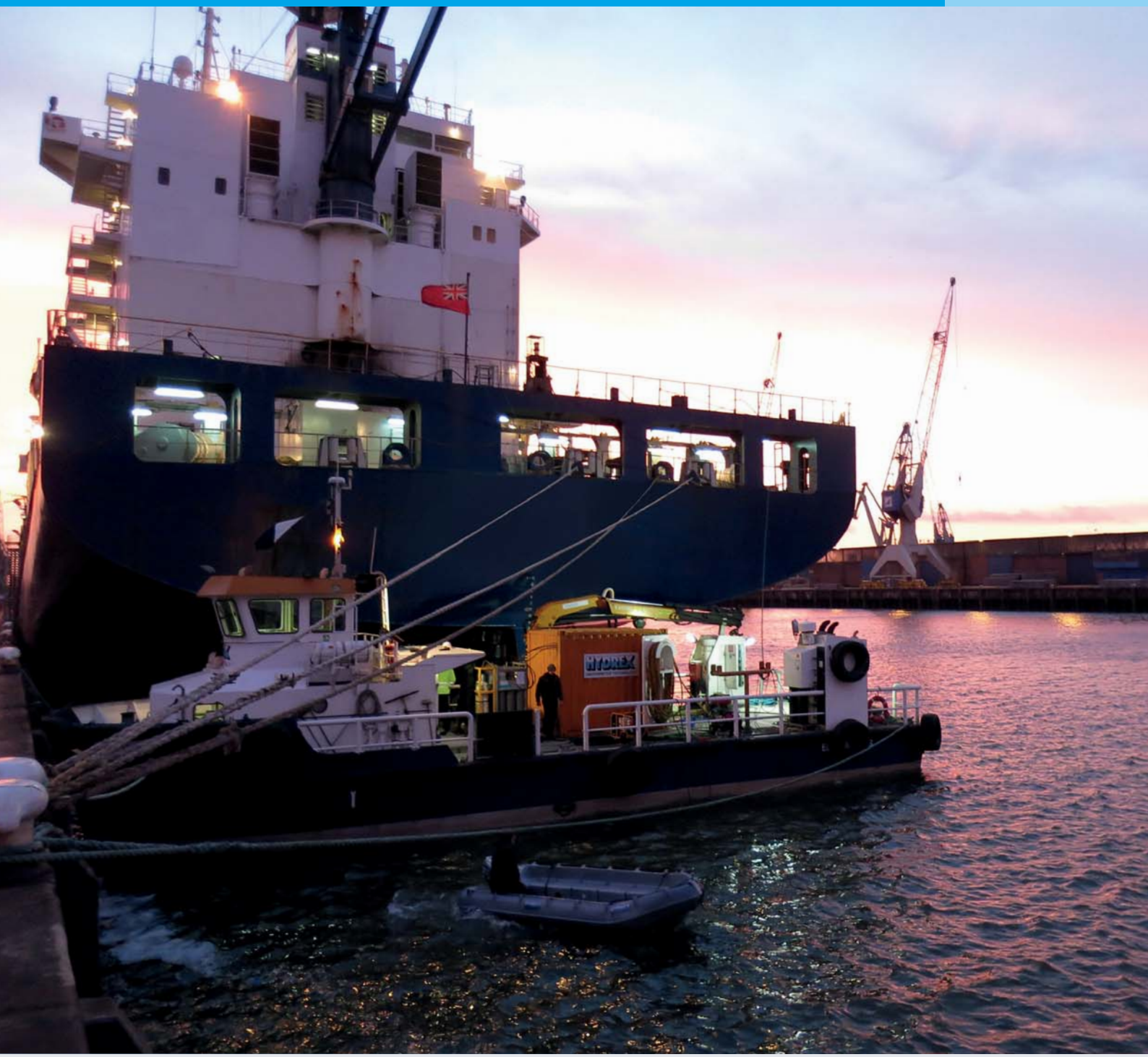
HYDREX®

UNDERWATER TECHNOLOGY

Magazine

Number *229*



Stern tube seal repairs

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 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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Editorial

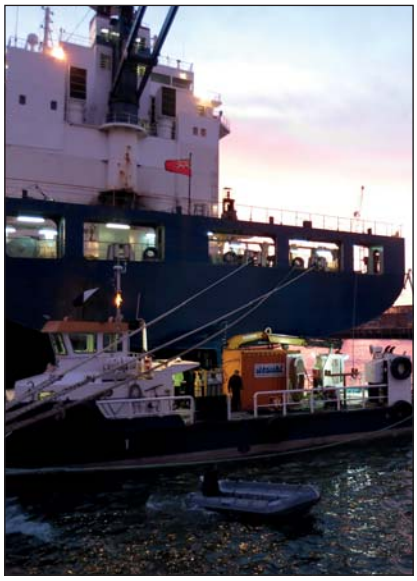
In this magazine you can read about a rudder repair performed in Rotterdam. One of our workboats was used for this operation. They are fully equipped as dive support stations and allow for a fast mobilization to Belgium, the Netherlands and France.

The repair in Rotterdam was carried out on a container vessel during the ship's scheduled maintenance stop. A doubler plate was installed over the cavitated area of the leading edge of the rudder.

A second article describes a propeller blade modification in Punta Del Este, Uruguay. Balance was restored to the propeller after several of its blades got severely bent. This repair was done with our in-house developed cropping equipment.

The magazine ends with an article on our fast response centers. These are a key factor in our services as they allow us to mobilize immediately during emergency or other operations. It is therefore essential that they are kept perfectly in order at all times.

Hydrex founder
Boud Van Rompay



Cover: Fully equipped Hydrex workboat, ideal for a fast mobilization.

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On Time Worldwide High Quality Underwater Services

ISO 9001 certified

Underwater services and technology approved by:

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RECOGNIZED ABS SPECIALIST
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Table of contents

Underwater rudder repair in Rotterdam with Hydrex dive support workboat

In the beginning of December a Hydrex diving team mobilized to a 170-meter container vessel with one of our workboats. The team installed a doubler plate over the cavitated area of the rudder during the ship's scheduled maintenance stop in Rotterdam.

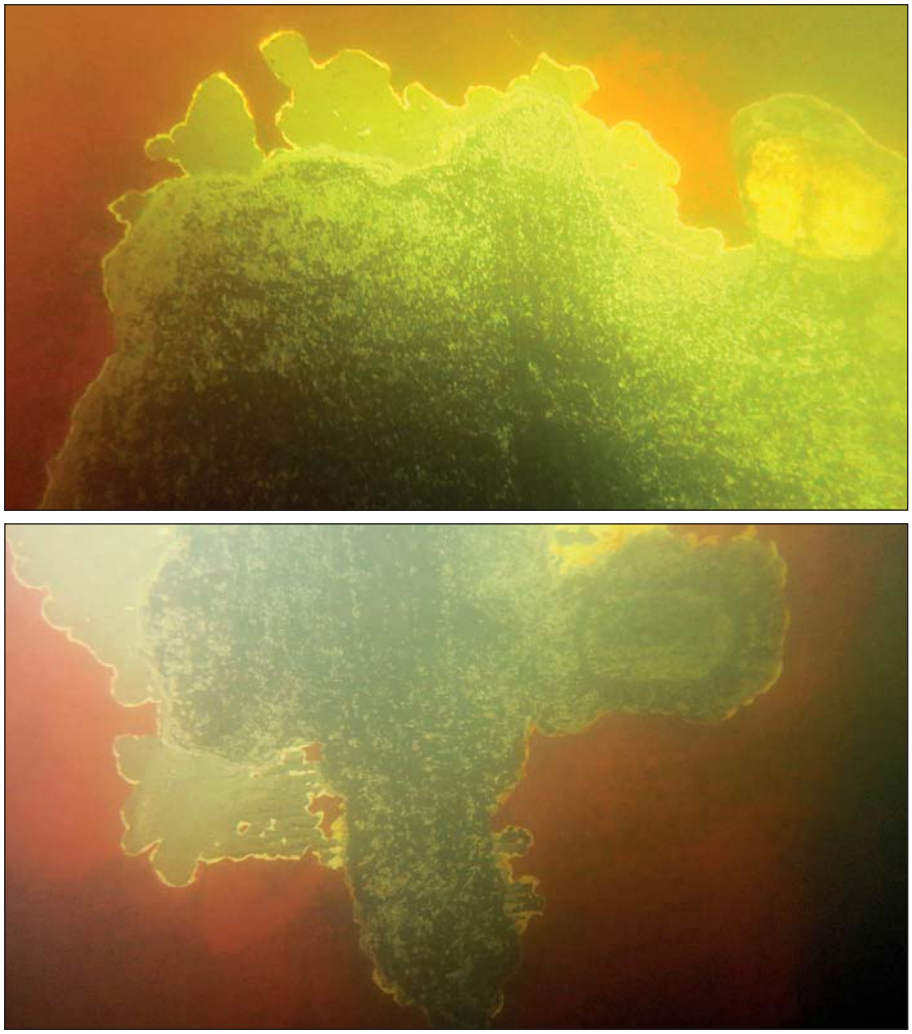
Hydrex dive support vessel approaching container vessel in Rotterdam.

An earlier inspection carried out in Algeciras had revealed the damage to the rudder. A condition of class was imposed on the vessel and a custom solution was needed. We proposed a repair plan to the class that would allow the vessel to keep sailing until the next scheduled docking.

Deployment to the vessel was done using a Hydrex workboat loaded with all the needed equipment. The catamarans are fully equipped as dive support stations with hydraulic cranes, winches and a dive control room. They can be used for a wide range of operations in Belgium, the Netherlands and France. This increases flexibility of operations.

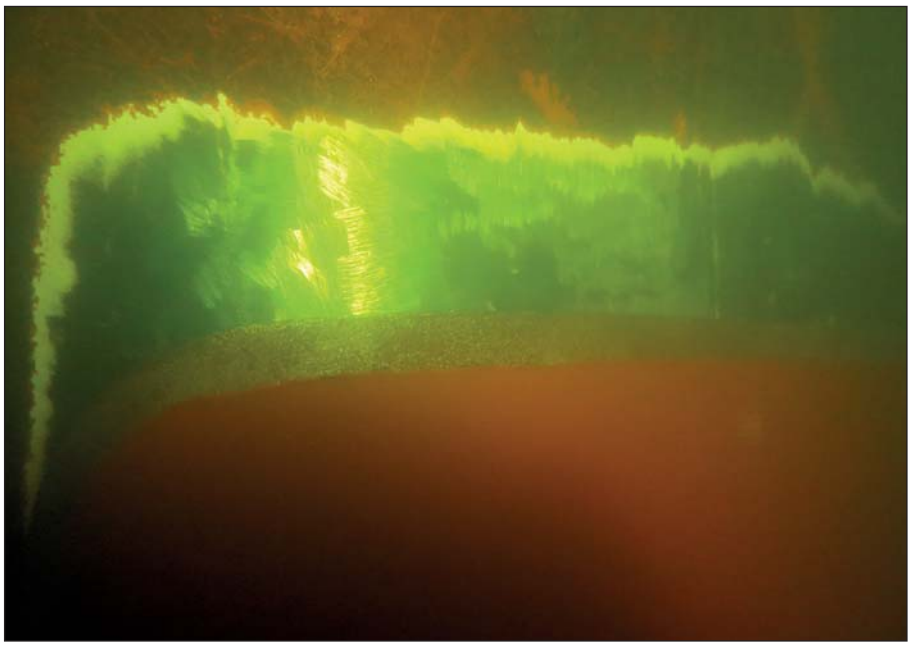
After our team arrived on-site with the workboat, they performed an underwater inspection of the leading edge of the rudder, where the damage was situated. The divers then started preparing the affected area for the installation of the doubler plate.

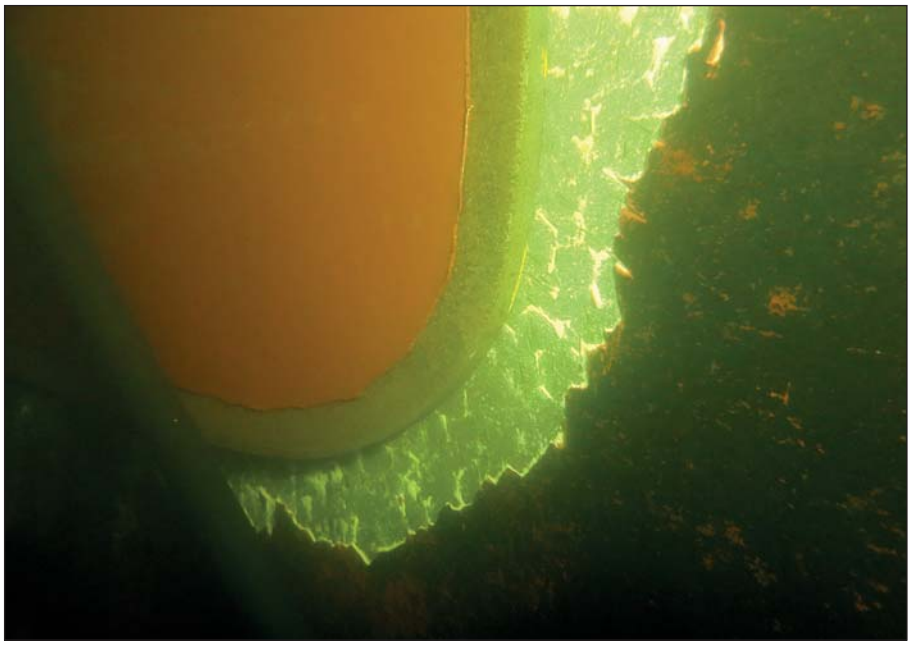
The plate had been prepared in advance. This was done with the information of the preliminary inspection in Algeciras combined with the



Damaged leading edge of the rudder.

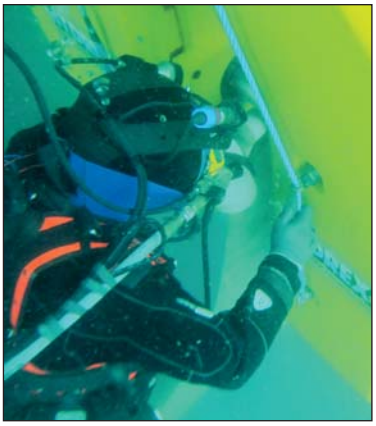
Hydrex team members on workboat discussing the operation.





Fitting the doubler plate.

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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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.

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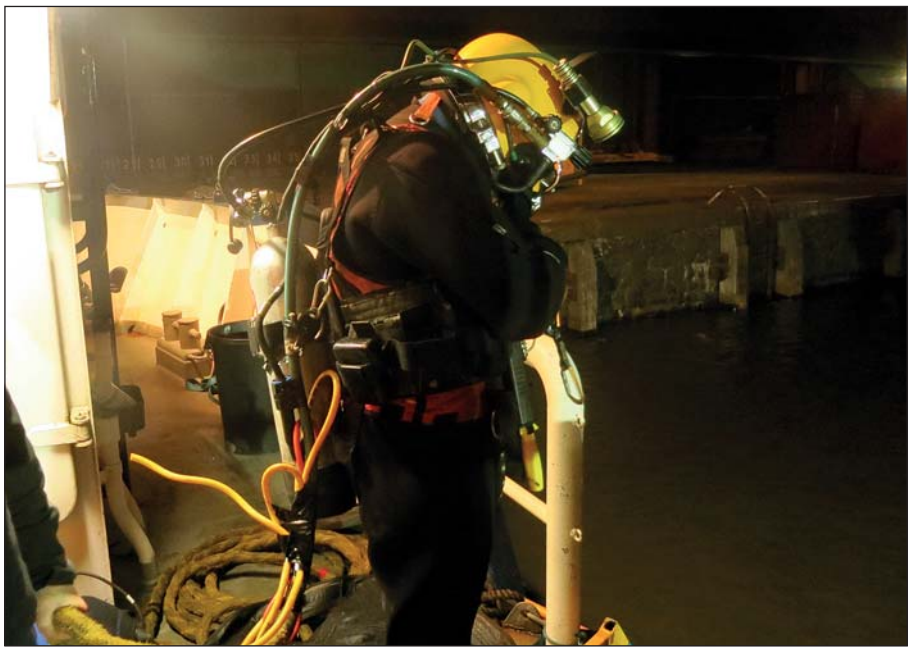
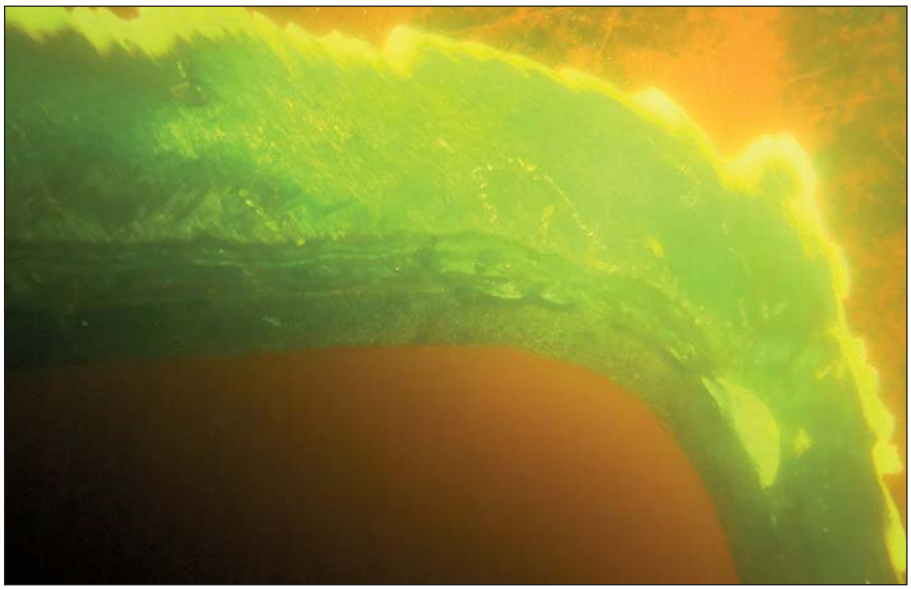
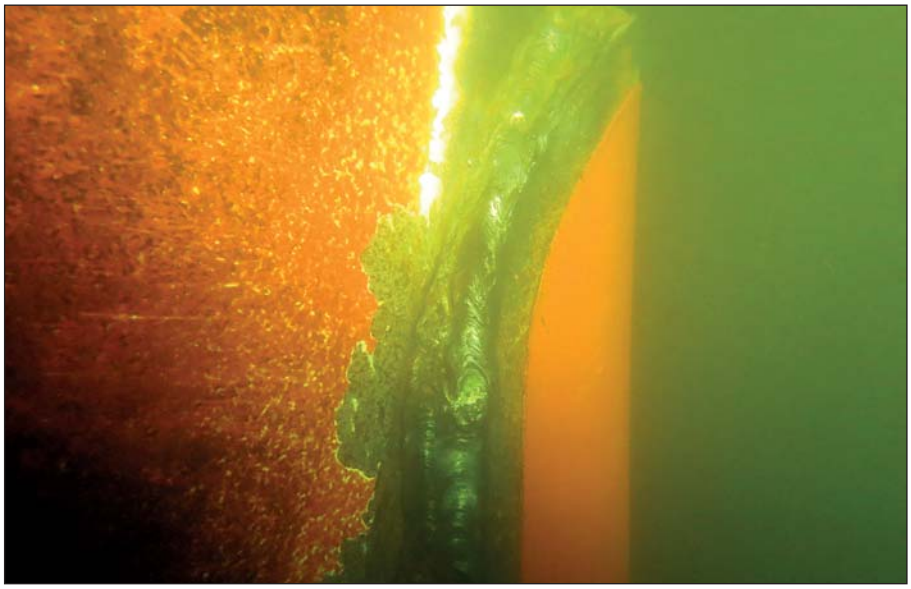
Fully equipped Hydrex workboat, ideal for a fast mobilization.



Diver getting ready during night shift.

Hydrex team leader monitoring underwater operation.





Doubler plate secured by certified Hydrex welders.

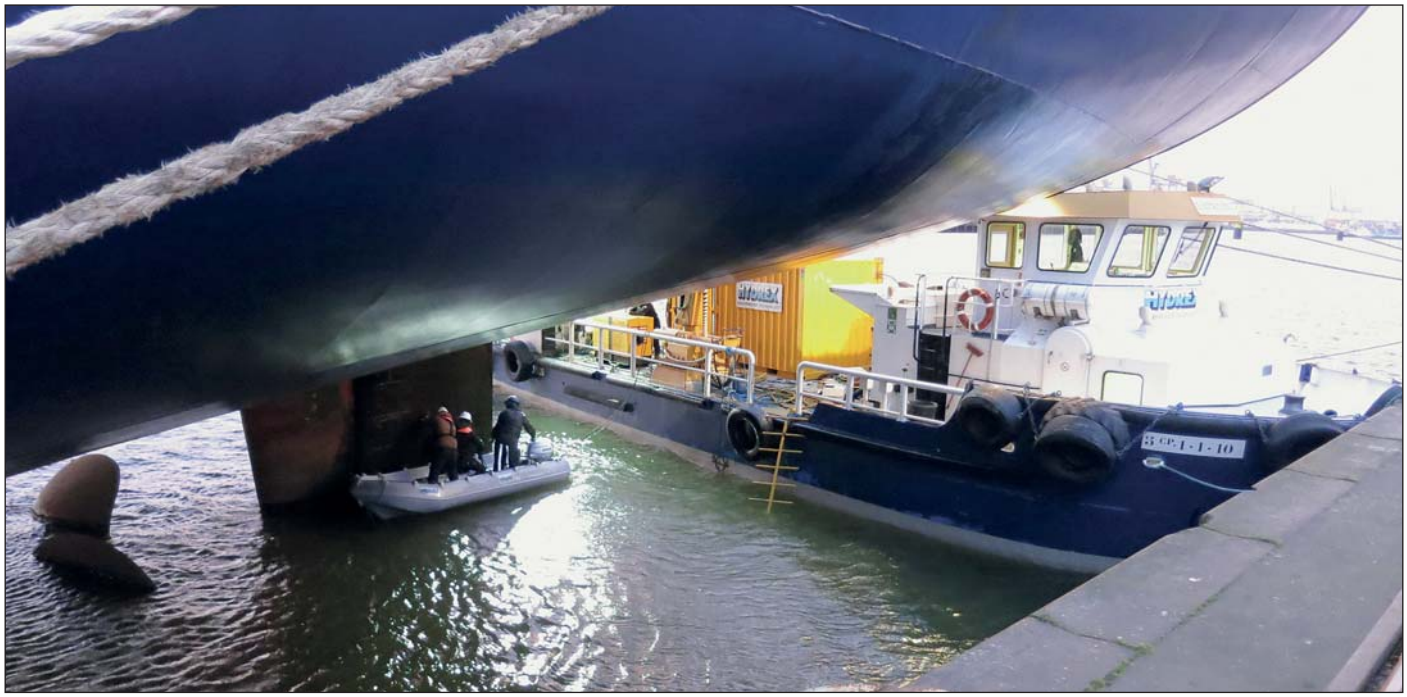
drawings of the rudder, provided by the owner.

When the rudder had been prepared our certified diver/welders fitted the plate and secured it. The team then installed anodes on both sides of the rudder for further protection. This concluded the repair.

Our dive support workboat allowed for a very fast mobilization to the ship's location in Rotterdam. The diver/technician team worked in shifts and finished the operation in 24 hours. By doing this the repair fitted in nicely within the schedule of the container vessel.

During the operation a representative of the classification society was present. He gave his approval for the repair. The owner can now sail his ship until the next scheduled drydocking without having to worry about further unscheduled delays or repairs to its rudder. ■

KEEPING SHIPS IN BUSINESS



Installation of the final anodes on trimmed part of the rudder.

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.

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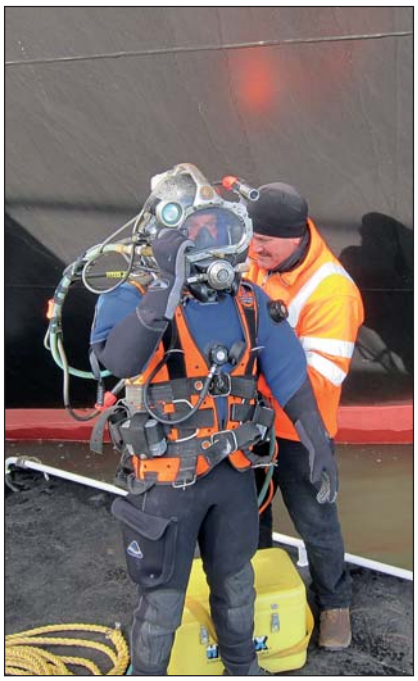
Underwater propeller blade cropping in Uruguay restores efficiency

In November one of our diver/technician teams performed a successful propeller blade cropping operation on a 229-meter bulker under difficult weather circumstances while the vessel was at anchorage in Punta Del Este. Because of the high swell, cropping was the only option.

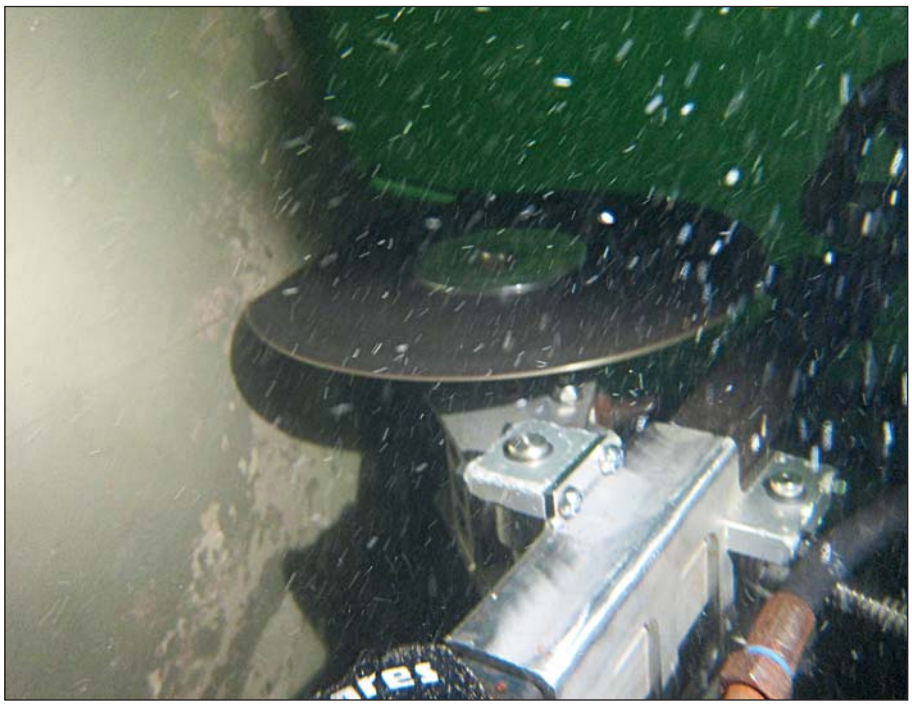
Bent propeller blades of 229-meter bulker.

When the propeller blades of the bulker got damaged, a fast on-site solution was needed to restore the propeller's balance with a minimal loss of efficiency. This would avoid an extended off-hire period to go to drydock. A Hydrex team was therefore rapidly mobilized to the ship's location in Uruguay. Here they met up with our local support base.

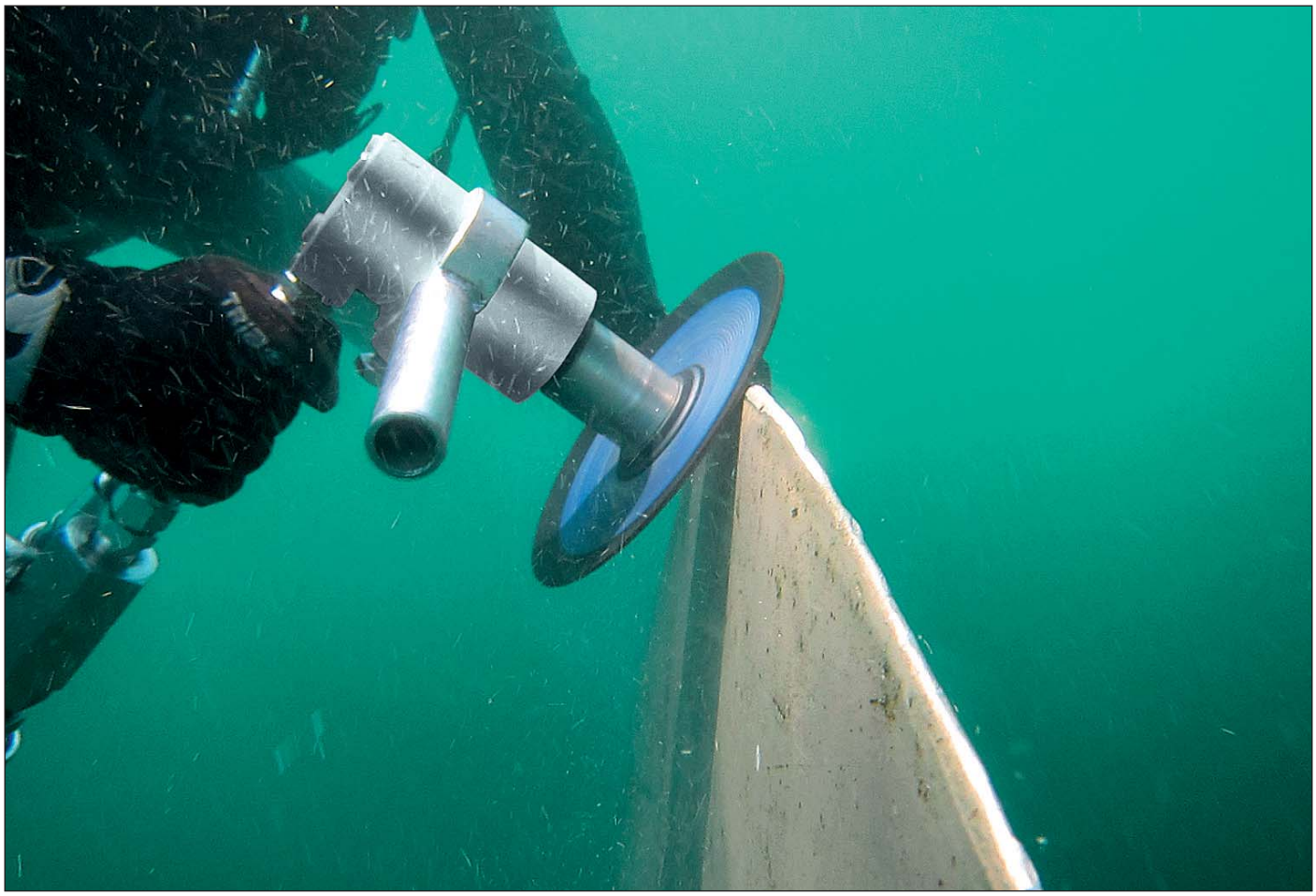
At the time of the repair there was a fast current. This meant that there was only a limited window available for our divers to safely perform the operation. Hydrex diver/technicians have experience with dealing with difficult circumstances while keeping to the highest safety and quality standards. They can carry out underwater repairs in the shortest possible time frame. Their expertise and experience allowed them to easily divide the operation in parts so that the cropping of the blades could be spread out over two days.



Hydrex diver ready for underwater operation.



Cropping one of the damaged blades in Punta Del Este.



Hydrex diver grinding the edge of a propeller blade to remove small nicks.

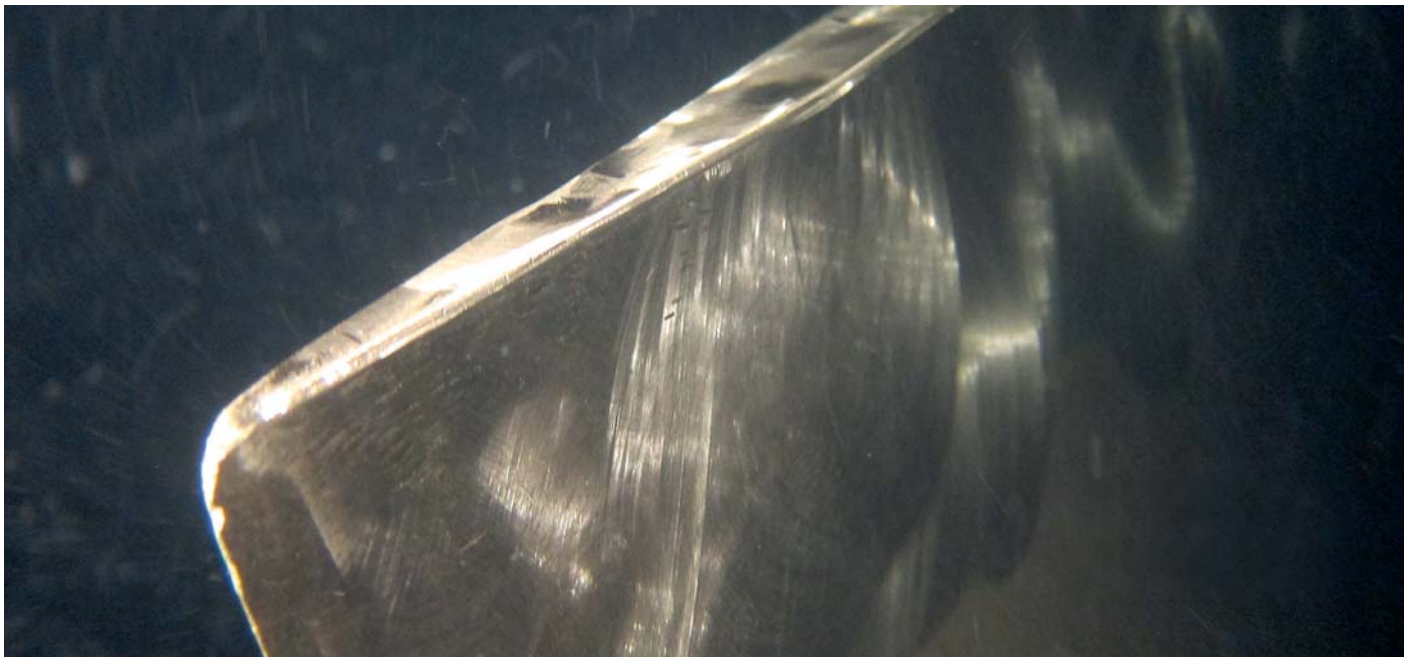
After the team arrived at the vessel's location, they started the underwater operation with a detailed survey of the affected propeller blades. This underwater inspection revealed that three of the four blades were bent severely.

This kind of repair is carried out with the propeller blade cutting equipment developed by the Hydrex research department. The equipment is lightweight and can be mobilized together with the divers.

The four blades of the propeller were cropped to restore balance.

The team used the information acquired during the inspection to calculate and determine the correct measurements needed to modify the tip of the propeller blades. The repair proposal was then discussed with the class and the owner. After it was accepted, the divers cropped the damaged blades and ground their edges to give them the correct shape. The fourth blade, which had not been damaged, was also cropped to keep the propeller's balance. When the cropping was complete the Hydrex technicians polished the blades to make sure that any remaining loss of efficiency would be minimal.

During the cropping a class surveyor was present. He gave his approval for the operation after a final inspection was performed.



Polished edge of cropped propeller blade.

Conclusion

Damaged propeller blades will have a performance below average and cause vibrations. The engine will have a higher work load. This results in increased fuel consumption and added stress. If straightening is not an option, the affected area on the blade will be cropped. By doing this the greatest possible efficiency is achieved for the vessel. This type of repairs can be performed on-site and underwater, allowing a ship to return to commercial operations without the need to drydock. ■

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or at
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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 lightweight and can be mobilized very rapidly in our special flight containers. Therefore this new service is now available worldwide.

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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State-of-the-art fast response centers allow swift mobilization around the world

The Hydrex offices have fast response centers that are designed for a fast mobilization to vessels all around the world. For this reason they are equipped with a wide-ranging stock of logistic tools and dive support equipment as well as a fleet of vehicles and workboats.

Hydrex Equipment officer Koen Smouts supervising mobilization of an operation.

Hydrex Equipment Officer Koen Smouts is the man responsible for the organization of these fast-response centers. “If you want to do a high standard job you have to have the right tools and equipment,” says Koen. “We train our divers to report as soon as something is not in perfect condition. When they come back from a job they have to check each item separately before they put it back on the shelves. That way they don’t have to worry about it when they take it off the shelves for a job, speeding up the response time. Buying all that equipment is a big investment and we want to keep it in perfect condition, to make sure that it lasts as long as possible.”

Koen has been to our US office a couple of times to train the new staff members and teach them how

Hydrex lightweight containers being loaded.

Hydrex containers and diving tanks, for in-house training.

One of the Hydrex workboats during operation in Rotterdam.

Mobilization for large operation in our Antwerp fast response center.

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 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.

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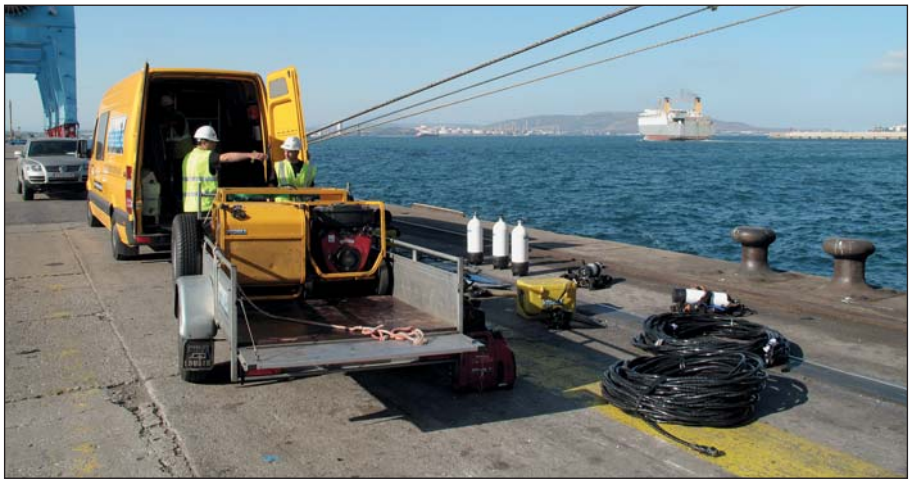
Hydrex equipment in fast response center in our Tampa office.

to organize their fast-response center in the most economical way. Showing people something is always better than just telling them. He did the same for our other office. New divers are also paired to experienced staff members in all offices.

Loading the trucks, vans and workboats for an operation is overseen by Koen to make sure that everything is carried out correctly. This is done in close coordination with the people of our technical department. "They receive the order and then check with me to see what we have in stock and what needs to be bought," says Koen. "I am in charge of rush purchases. This is necessary because if you have to leave for an emergency operation there is just no time to wait until it has gone through all the regular lines. You have to be able to react immediately."

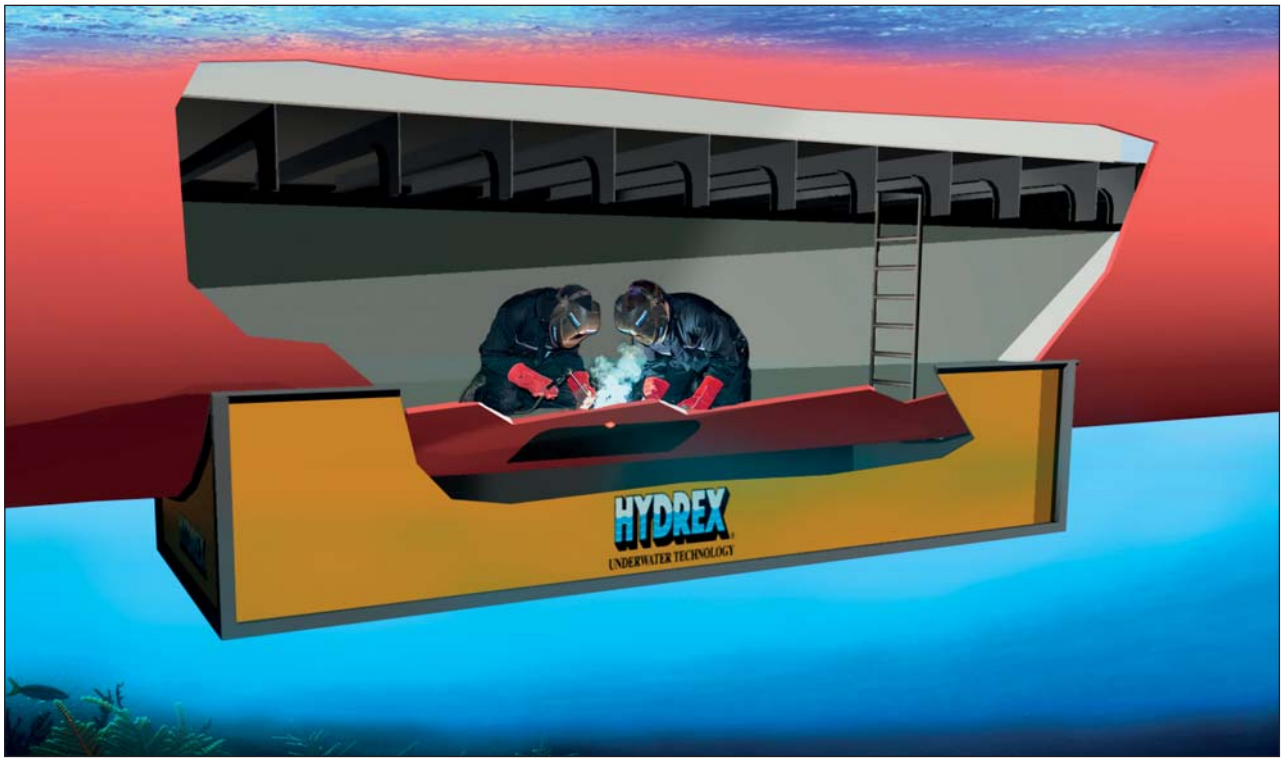
Every few years our entire fleet of vehicles is refurbished or replaced if needed. Trucks and vans are repainted and new vehicle graphics are applied. The inside of the vans is also updated regularly to turn them into state-of-the-art mobile monitoring stations. "It is essential," Koen points out, "that all the equipment you use, from clothing and shoes to containers and workboats, is in perfect working condition and looks pristine. This is very important for customers because how you look reflects on the quality of the work. If you don't look professional, how can you expect people to trust that you can work professionally? What people see above the water is reflected in what is carried out underwater." ■



Hydrex team and equipment during operation in the bay of Algeciras.

KEEPING SHIPS IN BUSINESS

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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Keeping ships in business

Hydrex offers turnkey underwater repair solutions to shipowners wherever and whenever they are needed. Hydrex's multidisciplinary 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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