

HYDREX[®]

UNDERWATER TECHNOLOGY

Magazine

Number 355



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*A ship that needs repairs
deserves the best,
anywhere, anytime.
We promise quality
and deliver it.*



Editorial



We take care of the entire underwater part of your vessel anywhere in the world. Providing a service that is both versatile and effective, we have built a reputation as the world's leading underwater repair and maintenance specialists.

With an ever-expanding worldwide network of offices and support bases, we can provide fast service at reasonable costs.

I hope that this magazine will encourage you to contact us if you have a problem or need maintenance work carried out. We can offer fast, tailor-made solutions that can keep your vessel on schedule.

I invite you to give us a call if you have a problem with your ship which you are not sure can be solved

afloat. We will evaluate the problem and let you know whether an underwater solution is possible. Many solutions are available without the need for drydocking.

Our technical advisors will inform you whether the operation is feasible underwater. We will give you fast and clear answers to your questions.

We can assist you with routine maintenance operations as well as complex repairs. Very simply put: We fix ships without drydocking.

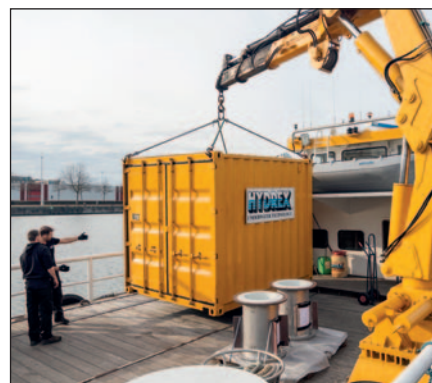
A handwritten signature in black ink, which appears to be 'BVR', followed by a long horizontal line.

Hydrex founder
Boud Van Rompay
bvr@hydrex.be

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Permanent shell plating repairs without drydocking

Damage to a vessel's shell plating can have immediate operational consequences. Whether caused by corrosion, grounding, cracking, or accidental impact, damaged hull plating often leaves owners facing unscheduled repairs, costly delays, and an unexpected drydock visit.

The following projects illustrate how we help shipowners overcome these challenges through underwater hull repair solutions. From permanent insert repairs in Rotterdam, Amsterdam, and Trinidad to emergency doubler plate installations in Las Palmas and crack repairs in Zeebrugge, each operation demonstrates how shell plating damage can often be repaired while the vessel remains afloat.

Hull damage rarely presents itself in exactly the same way. Some situations require a permanent insert



Hydrex workboat on its way to a repair site in Rotterdam.

plate replacing the damaged section of shell plating, while others call for a temporary doubler plate that allows the vessel to continue operating until the next scheduled drydocking. Working closely with classification societies, owners, and

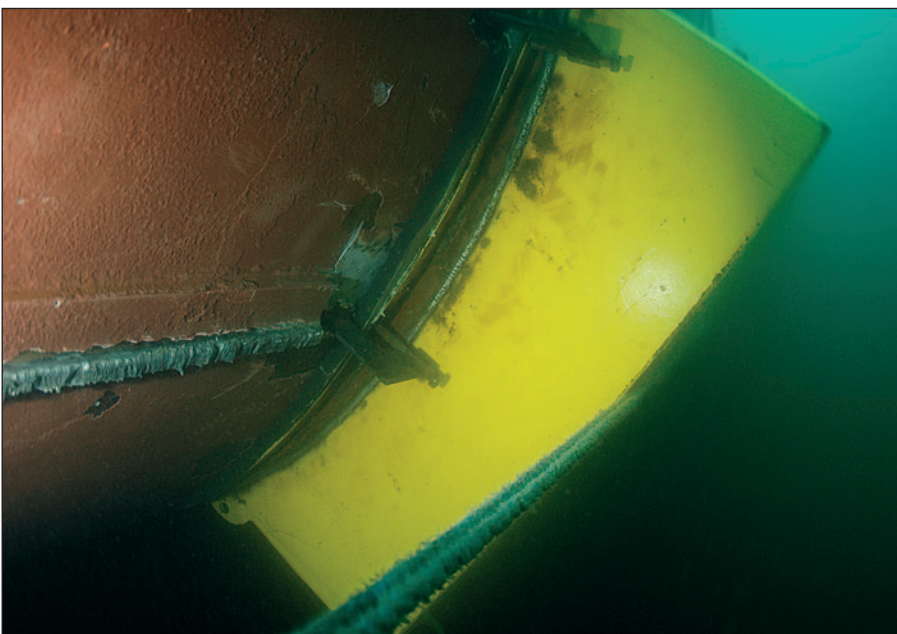
vessel crews, we develop the most appropriate repair method for each individual situation.

Case studies

Rotterdam: sea chest insert repair reveals larger damage

One project began in Rotterdam, where the starboard sea chest of a tanker's engine room sprang a leak. Initially, the owner requested an insert repair, but thickness measurements carried out by an independent NDT specialist revealed that the deterioration extended much further than expected.

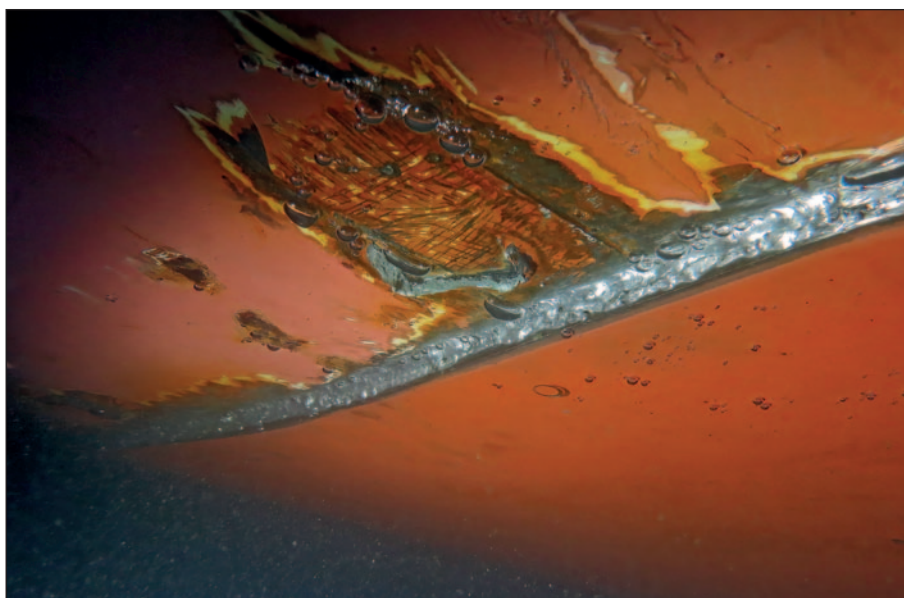
Working together with the vessel's crew and the attending classification society, we revised the repair plan before work began. After the sea chest had been emptied and all piping and coolers removed, our diver/welders cut away the damaged plat-



Tailor-made cofferdam secured over damage in hull plating.



Securing new inserts in Rotterdam with full penetration weld.



The doubler plate repair in Las Palmas allowed the owner to continue the ship's voyage and unload its cargo.

ing and installed two new insert plates using class-approved full penetration welds. Independent NDT confirmed the quality of the repair before it received final class approval.

Las Palmas: emergency repair after grounding

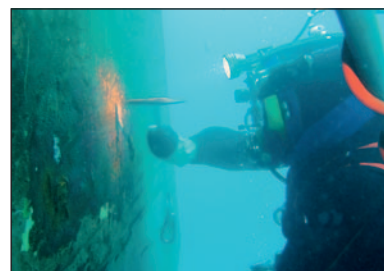
When a fully loaded 180-meter bulk carrier suffered grounding damage in Las Palmas, Spain, the owner required an immediate solution that

would avoid further delay. Following an underwater inspection, we fabricated and installed a doubler plate over the damaged area, allowing the vessel to resume trading while a permanent repair could be scheduled during a future drydock.

Port of Spain: permanent insert repair avoids drydock

A 164-meter chemical tanker in Port of Spain, Trinidad, required permanent repairs to damaged bottom plat-

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.

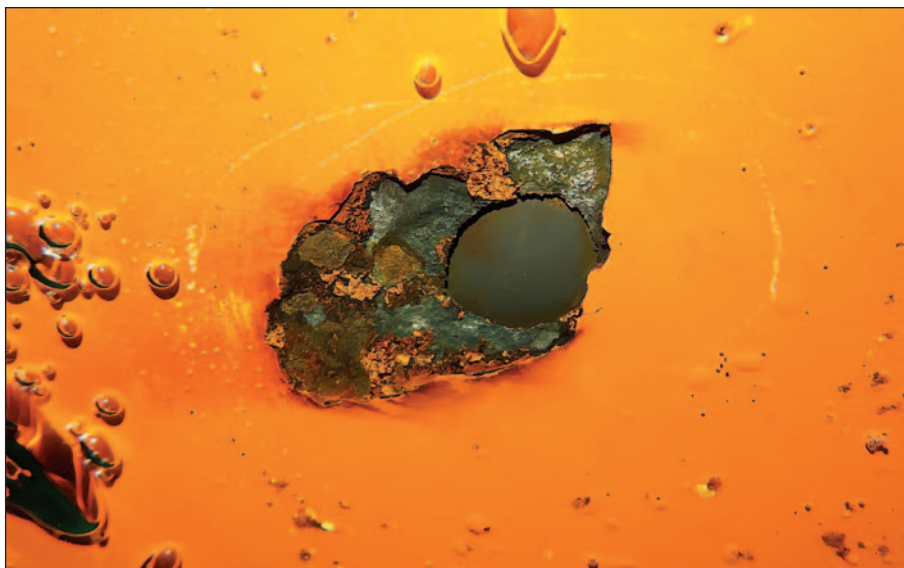
With fuel costs amounting to 40% of operational expenses and continuing to rise, reducing fuel consumption is a vital concern of shipowners. This is the reason why hull monitoring pays for itself. Underwater hull roughness, marine fouling, bent propellers and poor paint condition are all factors that 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.





New insert prepared at Hydrex workshop in Antwerp.



Damage on tanker in Port of Spain seen from the water side.

ing underneath a sounding pipe in one of its ballast tanks. A temporary repair had already been carried out, but the owner wanted a permanent class-approved solution without taking the vessel into drydock.

After installing a cofferdam, we removed the damaged section, prepared the opening, positioned a new insert plate, and completed the repair using our class-approved full penetration welding procedure. Following successful ultrasonic testing and approval by the attending classification surveyor, the cofferdam was removed and the vessel returned to service.

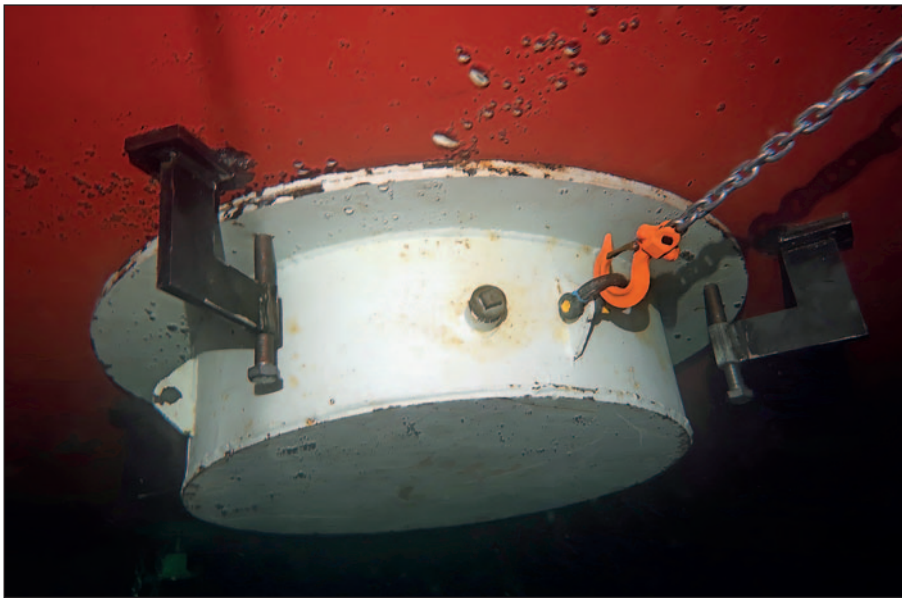
Amsterdam: engine room insert repair completed during port stay

A similar operation followed in Amsterdam, where a 144-meter oil tanker required an insert repair inside its engine room. Using the same repair procedure, our team installed a 300 × 300 mm insert plate while the vessel remained afloat. Thanks to extensive experience carrying out insert repairs in every area of a vessel's hull, the operation was completed quickly without delaying the ship's schedule.

Zeebrugge: crack repair keeps car carrier operational

Not every shell plating repair requires the installation of a new insert. When a 229-meter car carrier developed a leak in its forepeak ballast tank during a stop in Zeebrugge, Belgium, the damage consisted of a crack rather than severe plating loss.

After installing a cofferdam and preparing the damaged area, our diver/welders carried out the necessary welding work to stop the leak. The repair enabled the owner



Cofferdam installed over the affected area of the ship in Port of Spain.



Fully welded new insert.



Hydrex welder during operation in Amsterdam.

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.

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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Crack on car carrier after being ground out.

to postpone drydock until a more convenient time, avoiding an unscheduled interruption to the vessel's trading operations.

A repair method tailored to the damage

These projects show that not all shell plating damage requires the same

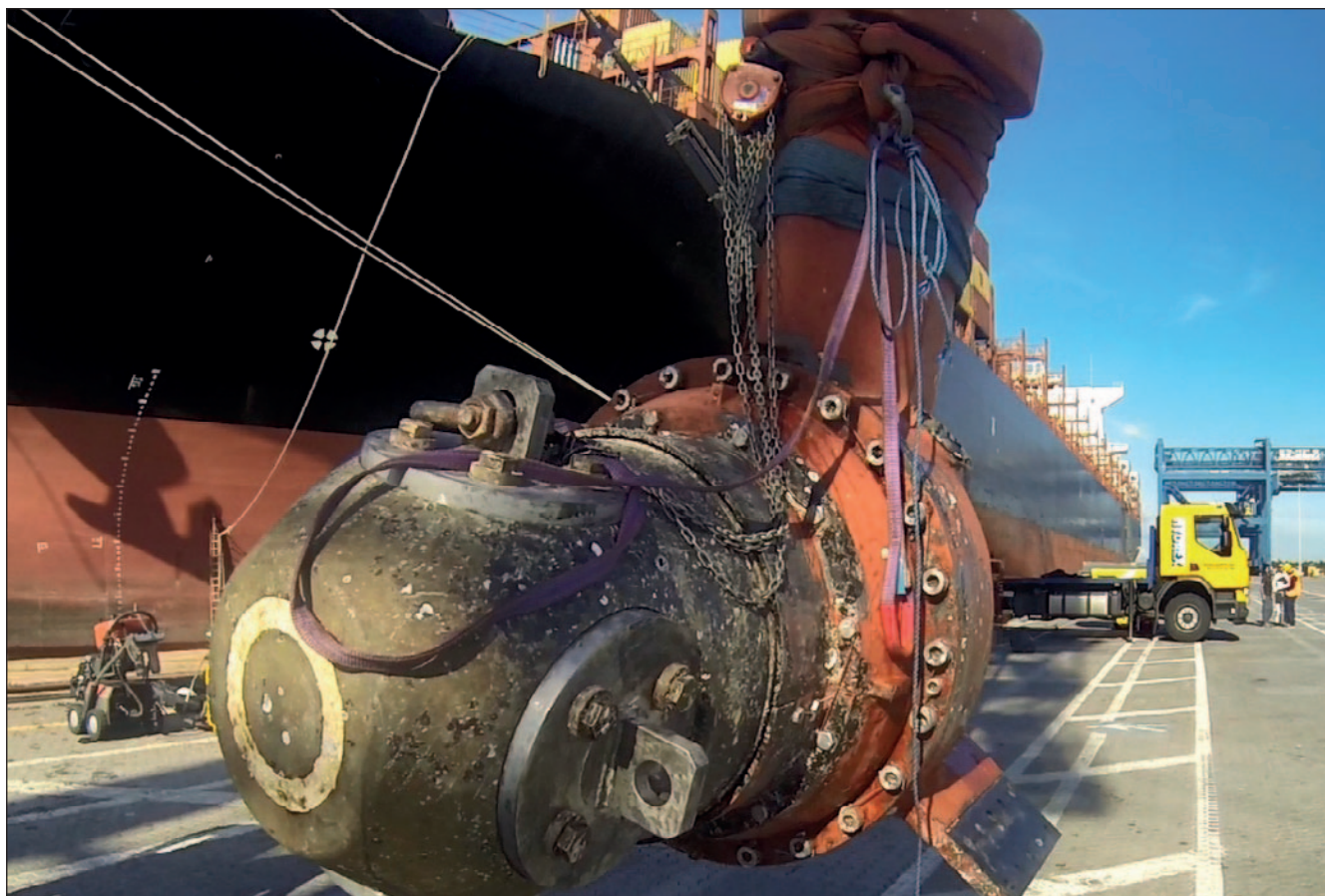
solution. Some situations call for permanent insert repairs that fully restore the hull structure, while others are best addressed with temporary doubler plates or crack repairs that safely extend the vessel's operating period until a planned docking.

Whether responding to an emergency grounding in Las Palmas, installing insert plates in Rotterdam or Trinidad, or repairing cracks in Zeebrugge, our objective remains the same: providing shipowners with class-approved underwater repairs that minimize downtime and keep vessels operating safely until — or even instead of — a drydock visit. ■



Crack repair after reinstallation of the longitudinal frame.

In-water bow thruster repairs



Our 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 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.

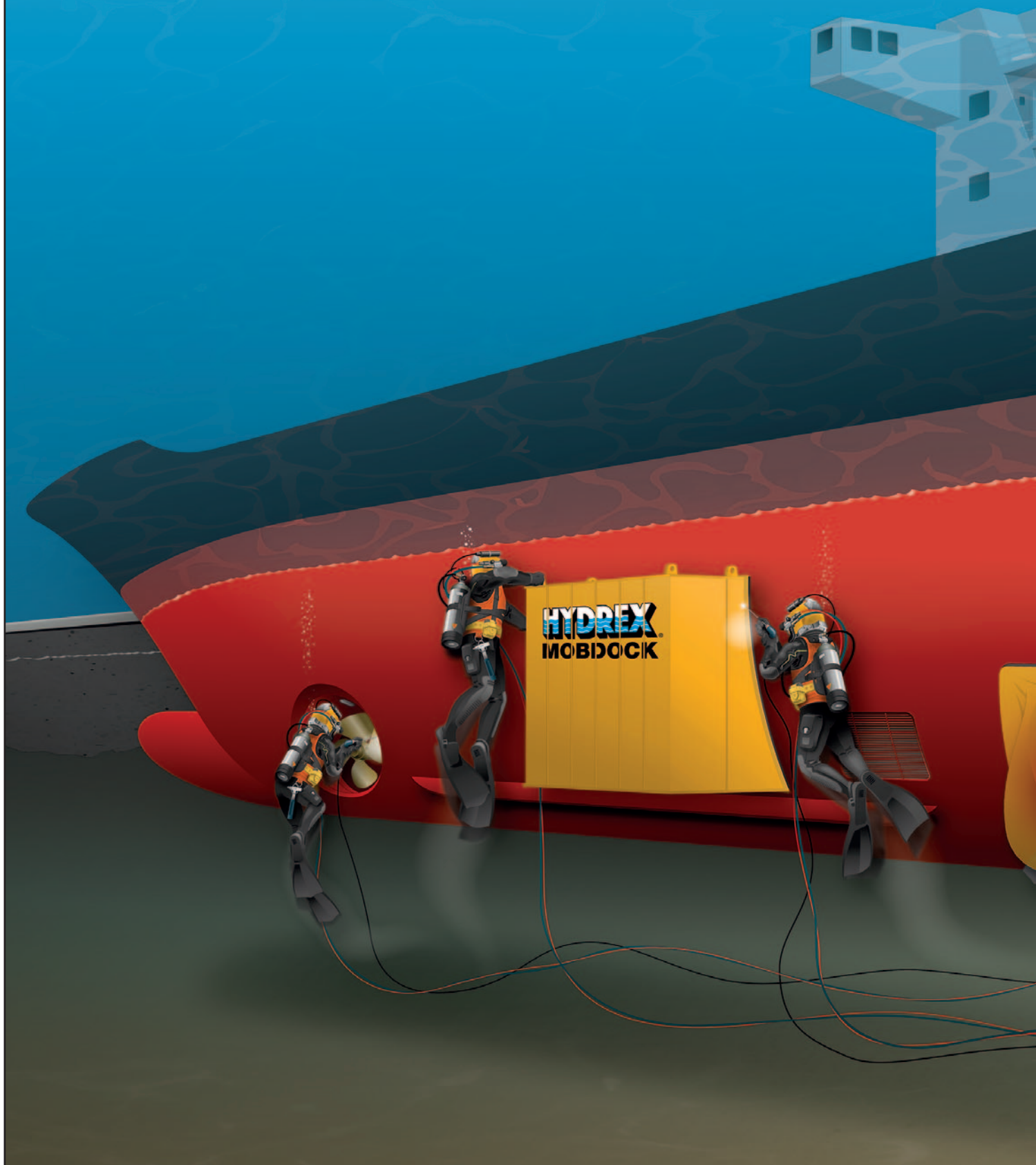
There is no need to send the vessel to drydock as all operations can be carried out in port or while the vessel is stationary at sea. Normal commercial activities can therefore continue without disruption.

+ 32 3 213 5300 (24/7)
hydrex@hydrex.be
www.hydrex.be

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Pit lane





Hydrex equipment and maintenance

A key aspect of providing rapid, high quality service

Any underwater repair or maintenance operation, no matter how complex or involved, does not begin with divers working underwater on the rudder or thruster or stern tube. The success of the operation starts in the company's depot, with the equipment, its quality, its maintenance.

No matter how willing, competent and hardworking the divers and technicians are, if they are working without the necessary equipment or with inoperational tools, the job can be delayed or fail completely. Even more important is the safety factor:



Hydrex truck and equipment next to vessel during operation.



Hydrex team member making a final check of the diving equipment. Making sure every piece of equipment is in perfect shape at all times is an essential part of any operation.

when you are dealing with divers, equipment failures can mean severe injury or worse. Our policy regarding equipment has been a major contributing factor to Hydrex's safety record of more than 50 years without a serious incident, as well as to our reputation for high quality work.

Safety, quality, efficiency

We don't make sure we have the best equipment available and maintain it as close to 100% as possible because it's "a nice thing to have." There are three key reasons that we maintain these standards: safety, quality and efficiency (including cost-efficiency for our customers).

Safety is our first consideration in every job we do. Diving done incorrectly with poor or broken equipment can be dangerous. Done correctly with the right training, equipment and teamwork it is very safe.



Two Hydrex trucks on the road en route to a job.

Quality of work is jeopardized by missing, broken-down or poorly maintained equipment or simply the wrong equipment.

Efficiency is a very important factor when a ship is in need of repair or maintenance. Service must be delivered quickly without wasted time and effort. This is also a key factor in the overall cost of a job. It is why we can repair stern tube seals, for example, in half or a third of the time it takes another company, and at lower cost, as shown in

numerous recent cases. Efficiency on the job represents a cost savings to our customers.

Poor equipment, lack of equipment, equipment that doesn't work, unsafe equipment all severely cut across each of these points.

"We never cut corners or try to save money by compromising on equipment and maintenance," says Boud Van Rompay, Hydrex founder and CEO. "It's been that way since day one."



Container with a dive station being loaded onto one of our workboats in preparation for a scrubber repair job in Rotterdam.

Fast response center

To ensure that we always have enough equipment and material on hand and that these are up to standard and in good order, in 2001 Hydrex built and moved into a large, clean, well-organized, fast response center on the water in Antwerp, Belgium. The facilities were expanded and modernized in 2018 and again this year; the fleet of vans, trucks and workboats all updated. Today the fast response center is state-of-the-art as far as equipment and vehicles, everything in excellent condition, ready to deliver advanced underwater maintenance and repair services wherever they are needed in the world.

"In order to expand our worldwide reach, we are in the process of fully equipping containers of equipment which we will place strategically in ports around the world," says Boud. "That way the equipment is on site and all we have to do is fly in our personnel, saving the customer time and costs. The containers will be identical, so the divers can walk in and find anything they need right away."



Two of the Hydrex workboats outside the rapid response center in Antwerp.





Inspection of lifting equipment by an independent testing and inspection company. Lifting gear is inspected every three months.

The Hydrex approach

Boud explains, “It has been our policy since Hydrex was founded in 1974 to have excellent, well-maintained equipment. Everybody contributes to executing the policy. Our Equipment Officer is maintaining it and making sure the discipline is kept in. But the discipline is demanded of everybody.”

“It has nothing to do with maintaining that ‘precious’ equipment because it cost a lot of money,” continues Boud. “The point is that it has to be maintained in working condition in order to ensure safety and maintain a high level of production. In underwater work, it’s a chain, starting with the van, the truck, the workboats that bring the equipment and divers to a worksite.



Workboat and Hydrex equipment en route to cleaning an offshore vessel in the Gulf of Mexico.

It goes from the purchasing to being channeled in the depot in the right places where it belongs and where it is maintained, and then it goes to the worksite. That entire chain has to be 100% or you can’t do the job. It’s a matter of, ‘For the want of a nail the kingdom was lost.’ We make sure that all the nails are in place.”

In good hands

Our Equipment Officer is responsible for maintaining the company’s standards with regard to equipment. It is constant hard work with many, many different factors and logistics to deal with continually.

He also ensures that all the rules and regulations regarding the equipment and the facilities are complied with. This includes arranging the necessary inspections of equipment, tools and vehicles, all the way from lifting gear to workboats to practice diving tanks. It takes excellent teamwork among all Hydrex divers and technicians to keep the equipment in good working order, and the fast response center orderly so that items can be found and mobilization for jobs is rapid and efficient.

ISO 9001 and ISO 45001

Hydrex has maintained ISO 9001 certification since 1997 which has been a key measure of the quality level of the whole organization, including the equipment. We have also always maintained or exceeded the required safety standards, but have upgraded to ISO 45001 certification. “Because it is an ISO standard, it works in parallel with ISO 9001,” explains Manuel Hof, who is responsible for quality and safety standards for both Hydrex and sister company, Subsea Industries. “This upgrade gives our customers even more confidence in our insis-



Van and trailer being loaded with equipment in one of our rapid response centers.

tence on the highest levels of safety,” he adds. In fact it did not require many changes to obtain the ISO 45001 certification since Hydrex has maintained rigorous safety procedures from the beginning. This has always included having topnotch equipment and keeping it in excellent working order.

Who wins?

In the final analysis, excellent equipment well maintained, in the hands of knowledgeable and experienced divers and technicians, benefits everyone, but particularly the cus-

tomers. The result is speedier response, a faster and higher quality underwater operation carried out more cost-effectively.

Case in point

Hydrex was asked to carry out a hull cleaning on a vessel coated with Ecospeed. The local diving company who were supposed to clean the ship were not able to achieve a good result. We sent a team of two divers armed with two power packs and cleaning machines to go and rescue the situation. The divers arrived at the ship’s location and went to work.

They were able to achieve an excellent result on the ship’s hull immediately. When they checked with the local divers to establish what the problem was, they found out that the power pack they were using was deficient and not able to deliver the necessary power required for effective cleaning. It was, in fact, the same power pack that our divers were using, but it had been dropped into the sea at some point and not properly repaired and restored. The result was a faulty power pack that could not deliver enough power to drive the brushes and effectively clean the hull. This is perhaps a minor example, but it makes the point. Due to poorly maintained equipment, the job could not be done correctly even by competent divers, and the customer was paying a higher fuel bill due to an inadequately cleaned hull. And nobody had spotted the real problem. This becomes much more serious on a major repair.

Conclusion

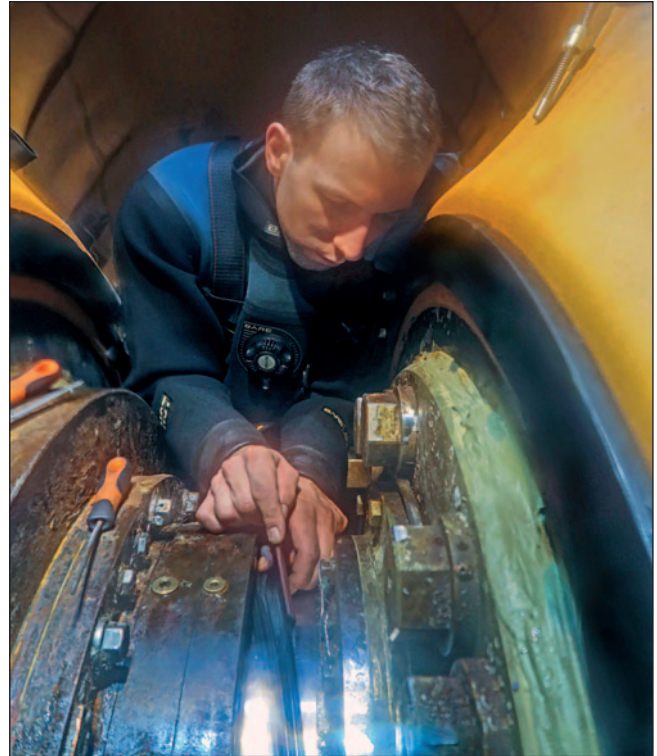
This policy regarding equipment has always been a key distinguishing factor of Hydrex services and a secret of our success. ■

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:
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**KEEPING SHIPS
IN BUSINESS**

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- Immediate response to minimize vessel downtime
- Accurate estimates with final invoices that match
- Typical stern tube seal repair/replacement by Hydrex:
Two (2) days start to finish
- All major brands repaired/replaced

We're here when you need us



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