



UNDERWATER TECHNOLOGY

Magazine

Number 311



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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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HYDREX
UNDERWATER TECHNOLOGY

Editorial



Welcome to the last Hydrex magazine of 2022. Rest assured that we will remain ready to assist you 24/7 through the holidays and 2023, so do not hesitate to call us with your underwater repair needs, routine or emergency.

In the first article in this month's magazine we write about a recent hull repair one of our teams performed in Algeciras. As with all shell plating operations we offer to our customers, the repair was carried out very fast and to the high quality and safety standards we are known for.

This brings us to the longest article in this magazine in which you can find out how we are able to adhere to these quality standards. Our diver/technicians are trained and qualified to perform all required

class-approved repair procedures in even the harshest conditions. This contributes to our outstanding track record and extraordinary dependability. But it is not the full story, as you will read in the article.

If you need more information on any of our underwater services, do not hesitate to contact us. We are always available to answer your questions.

I wish you all the best for the Holiday Season and the coming year.

Hydrex founder
Boud Van Rompay
bvr@hydrex.be
www.hydrex.be

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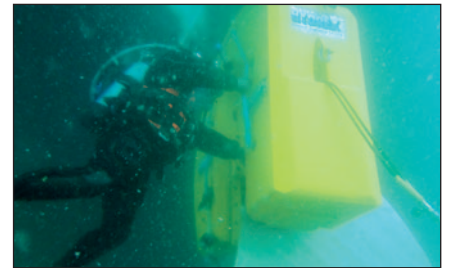


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ISO 9001 certified

Underwater services and technology approved by:



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Class-approved underwater shell-plating replacement in Algeciras

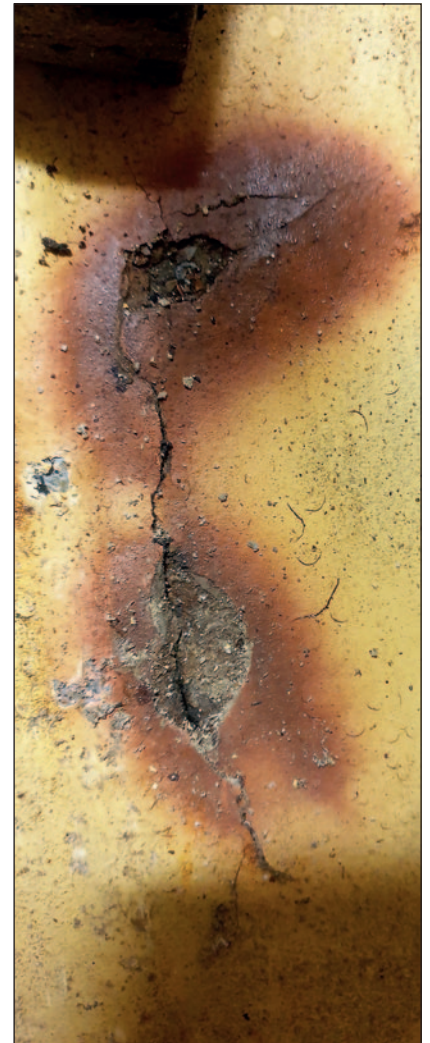
A 135-meter tanker suffered cavitation damage to the inside shell-plating of one of its ballast water tanks. We mobilized a team to Algeciras to perform a permanent insert repair that would prevent an unscheduled drydock visit for the vessel.

The team sailed with a workboat and all necessary equipment to the ship which lay at anchor in Algeciras.

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 150 mm long. In close communication with the superintendent of the vessel and the attending class surveyor, it was decided that a 300 x 300 mm insert would need to be installed.

The divers started the operation by removing a part of the bilge keel. This was required to install our customized cofferdam on the waterside of the affected plating. Because it needed to fit the rounded shape of the hull perfectly it was tailor-made at our fast response center.



150 mm crack in shell plating of tanker in Algeciras.



Hydrex diver/technician measuring the crack.

Next they removed the cement box which had been installed as a temporary solution. The damaged plating was then cleaned and prepared for the operation.

As agreed with the classification society, the team then cut away an area measuring 300 x 300 mm. Next they prepared the edges of the opening for the insert and positioned the new plate. The insert was then welded following the Hydrex class-approved procedure for insert plates, using a full penetration weld.

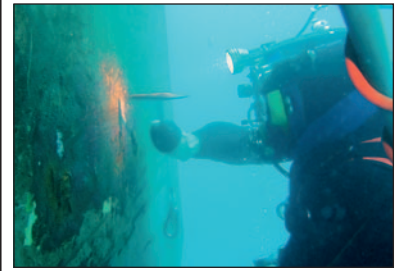


Damaged area prepared for removal.



Diver getting ready for underwater operation.

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.





Welding the insert.



Hydrex diver/technician working on the edges of the insert.



Fully welded insert.

An independent inspector carried out ultrasonic testing and the repair was approved by the classification surveyor who was present during the operation. The team then removed the cofferdam.

A fast, permanent solution

By removing the cracked section of plating and installing a new insert this area of the ship will not require further repairs during its next dry-docking. The vessel could sail on time as the repair was carried out well within the stipulated time frame.

The operation in Algeciras was performed to the highest quality standards by in-house trained diver/welders. We have a wide range of cofferdams at our disposal as well as certified plating which we can mobilize immediately to any location around the world.

Repairs like this can be carried out above or below water, according to the circumstances, with external cofferdams. Normal commercial activities can therefore continue without disruption.

If you have any questions regarding shell plating repairs, do not hesitate to contact us. We are at your disposal 24/7 and ready to mobilize almost immediately. ■

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Hydrex ready to assist you during the Holiday Season

The Holiday Season is nearing and most people are looking forward to a well-deserved break. At Hydrex we remain at your service throughout the entire end of the year period, 24/7.

A problem with your vessel can occur at any moment during the year, so we know how important it is to have someone you can rely on anytime, anywhere.



Hydrex team working in winter conditions.



Hydrex workboat during operation.

If your vessel is in need of any type of underwater service, you are very welcome to mail us or give us a call. After an evaluation of the request we can quickly let you know whether an underwater solution is possible. We will give you a fast and clear answer to your questions.

Our offices in Antwerp, Rotterdam, Algeciras and Tampa are ready to assist you together with a network of agents and local support bases. We are able to mobilize immediately.

Any question or enquiry can be sent to hydrex@hydrex.be. You can also call us 24/7 at +32 3 213 53 00.

We wish you all the best for the New Year and hope you can sail safely and without trouble. ■



Harsh conditions do not stop our dive teams.

**KEEPING SHIPS
IN BUSINESS**

Underwater propeller blade straightening in the British Indian Ocean Territory

With all five blades of its propeller severely bent, a 290-meter container vessel needed a fast, on-site solution to restore the propeller's balance and efficiency. Hydrex divers are trained to carry out repairs underwater in the shortest possible time frame and a team was therefore mobilized to the ship's location in Diego Garcia in the British Indian Ocean Territory to perform a cold straightening of the blades.

After the equipment arrived at the vessel's location, the divers installed a monitoring station on a workboat and made all the required preparations. The workboat was positioned next to the vessel. The team leader



One of the five bent blades of a container vessel's propeller.



Hydrex diver positioning the cold straightening machine over one of the blades.

then went on board to go over the safety procedures and to discuss the details of the operation with the captain and the chief engineer of the ship.

Next the team started the underwater operation with a detailed survey of the damaged propeller blades. Because fouling was present on the blades, the divers carried out a cleaning to be able to inspect the blades for stress fractures and cracks. The inspection revealed that the five blades had suffered multiple deformations along the trailing

edges and that there were stress fractures and nicks in the same areas. Cracks were also found going up to 15 mm deep into the blades.

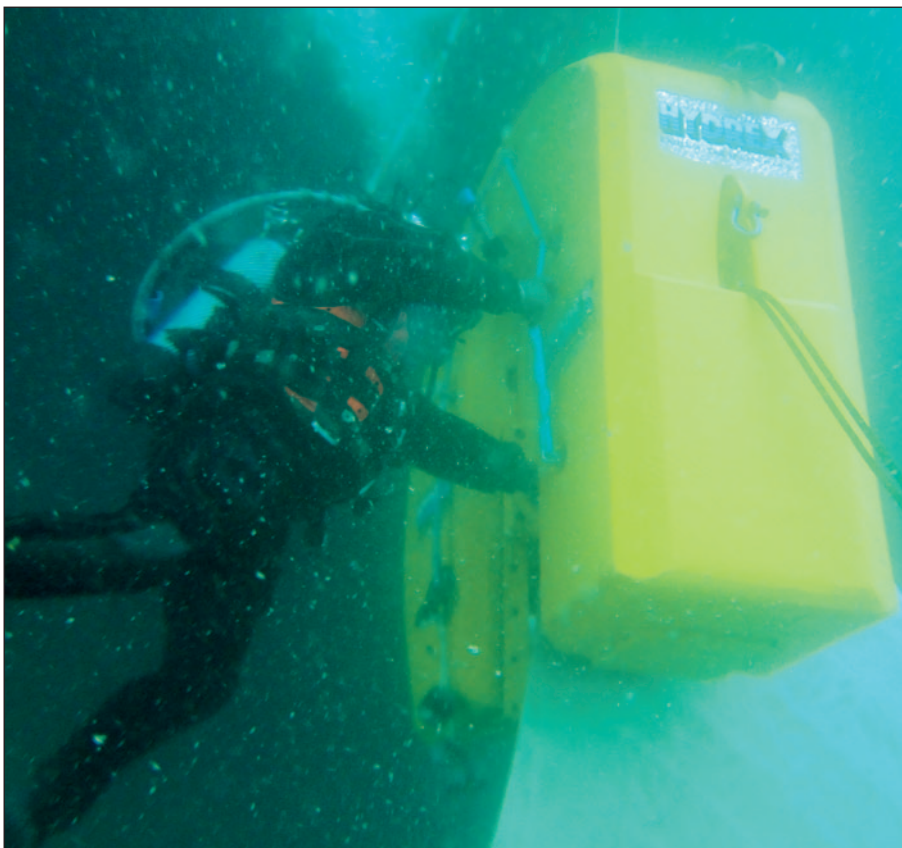
Part of the team then started the repair with grinding work on the blades to remove the cracks. Once this was done the locations were smoothed to recreate the hydrodynamic profile on the trailing edges. Meanwhile the rest of the team prepared the in-house developed hydraulic cold straightening machine for the operation. The divers then carefully positioned the ma-



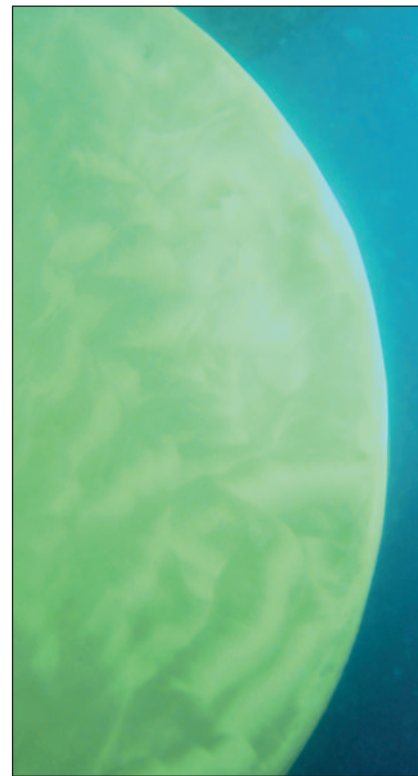
Hydrex diver carrying out grinding work on the trailing edge of one of the blades.

chine over the bends of the trailing edges of the first blade. In close communication with the team leader on the workboat they applied pres-

sure to return the bent blade to its original state. This procedure was then successfully repeated for the other four blades.



With the cold straightening machine bent blades can be restored to their original form.



Straightening the blades and polishing their trailing edges restored the propeller's optimum efficiency.

When the divers had also completed grinding and polishing repairs on all identified cracks and gouges, they made a full inspection of the newly modified blades for the attending ABS surveyor and the captain of the vessel. With all parties involved satisfied, the divers demobilized their equipment and returned home.

The operation restored the balance and the efficiency of the propeller. By carrying out the straightening on-site and underwater, Hydrex avoided a costly and time consuming drydock visit for the owner of the vessel. ■



Hydrex quality

When we asked our clients and prospects what they needed from an underwater repair and maintenance company, their answers can be summed up in two words: **SPEED** and **QUALITY**. Clearly these two must go hand in hand on every job. A very high-quality job that holds a ship up for an extra four days is unacceptable. A very fast repair that doesn't fully solve the problem is as bad or worse. In fact we have often been called in to repair a repair done by a less experienced or skilled company. Speed and quality combined also result in cost savings for the client.

The subject of *speed* has been covered in another article. In this article we concentrate on *quality*.

The meaning of quality

What do our clients mean when they demand quality, and what do we mean when we claim to deliver top *quality* work? A company offering



Hydrex Founder and CEO, Boud Van Rompay, going over a scrubber replacement job with the Team Leader prior to departure for the ship.



L-R Jonathan De Kerf, Clément Paquet, Timo Verhoegstraete, Dave Bleyenbergh, working on preparations for an upcoming operation.

maintenance and repair services is different from one that delivers new products such as propellers, depth sounders or ships.

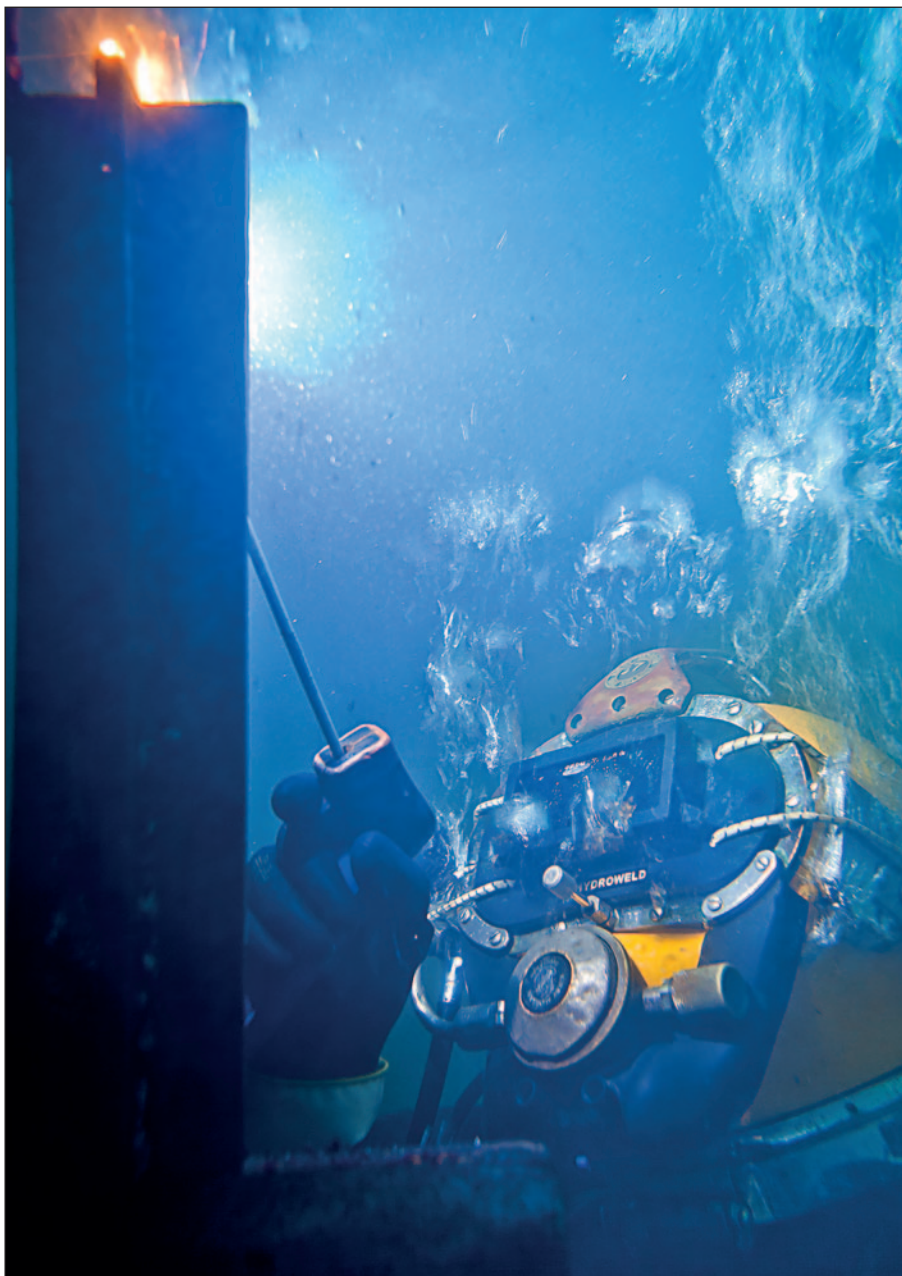
According to the Oxford English Dictionary, "Quality" is, the standard of something as measured against other things of a similar kind; the degree of excellence of something.

It comes from "Latin *qualitas*, from *qualis* 'of what kind, of such a kind'"

To us, a high- or top-quality job is



Team Leader Clément Paquet (right) goes over the details of a double plate repair on a Ro-Ro vessel in Rotterdam.



Diver learning underwater welding techniques in one of the test tanks at Hydrex in Antwerp.

one where the client's requirements are met completely or exceeded. A temporary hull repair, for example, must be of a quality that enables the ship to sail to its intended destination for full repair safely without leaking. A stern tube seal repair must be done so well that not only is the leak stopped, but the replacement seals last without leakage for at least the length of time specified by the OEM. This is one reason we insist on using only OEM and not off-brand seals. A propeller polishing fully polishes the entire propeller so that it is completely smooth and fuel efficient. And so it goes. We aim for this level of quality on every operation. We guarantee our work. And we have a remarkable track record. This level of quality is combined with speed of delivery and remains cost-effective for the client.

Basics: order, cleanliness, respect, teamwork, attitude

Boud Van Rompay, Founder and CEO of Hydrex, recalls the early days and the steps he took to inspire this level of quality of work in his team of divers and technicians. "I remember in the 1970s when we were just beginning, I used to go to our workshop near the shipyard on a Saturday. I would clean up the mess left by the divers, make sure all the equipment was in good repair, put everything away and leave the depot spotless and in perfect order. To begin with I had to do this myself to show the others what I expected. After a while, when they saw what I wanted, they started doing this themselves. When you keep everything in order and clean and operational, it is very easy to see when there is a problem or trouble spot. It stands out. You might wonder,





The dive station is used to monitor the work of the divers underwater, direct them as needed and record the operation.

‘What does this have to do with quality?’ But when you go into our depot today or climb aboard one of our trucks, vans or workboats the first thing that strikes you is just how clean and orderly everything is – it speaks of a high-quality operation. This, to me, is the first step in achieving a high-quality product or service. It’s a tradition in Hydrex often commented on by others in the industry. We run the tightest, cleanest, most orderly and well-equipped show.”

Boud continues, “This fact, all on its own, generates respect. New people coming to work for us are attracted by this and respect it. This then translates into teamwork and a team of competent individuals who share high standards of order and quality of work.”

Finishing things

With these basic factors in place, the next most important element in delivering top quality service is

completing actions. When parts of a job are left incomplete you have trouble. Each part of a job completed well results in the overall job ending successfully. So everyone on our team learns to complete actions and not leave anything open or undone.

Underlying attitude

Toon Joos, Chief Diver, points out the underlying intention or attitude that is key to success: “Our viewpoint, when we go on any job, is that no matter how difficult it is, no matter what obstacles we run into, we will always deliver a correct end product to the customer. That’s why we never fail a job.”

The team leaders and team members who go out on a job are all trained to think on their feet and deal with whatever comes up in order to get the job done.

“What we do at Hydrex is we solve problems,” says Jonathan De Kerf, a recently promoted Senior Diver. “Often these come up at the start of the job when we see exactly what we have to deal with, but can also show up during the job. When a problem arises, we solve it. As Team Leader, I have full responsibility for the final success of the job.”

Teamwork

“Teamwork is most important to quality,” Toon says. “It starts with the inquiry and the quotation in the office and continues through the confirmed order to the preparations and assembly of the team all the way through to the completion of the job and the final report to the client. We work as a team.”

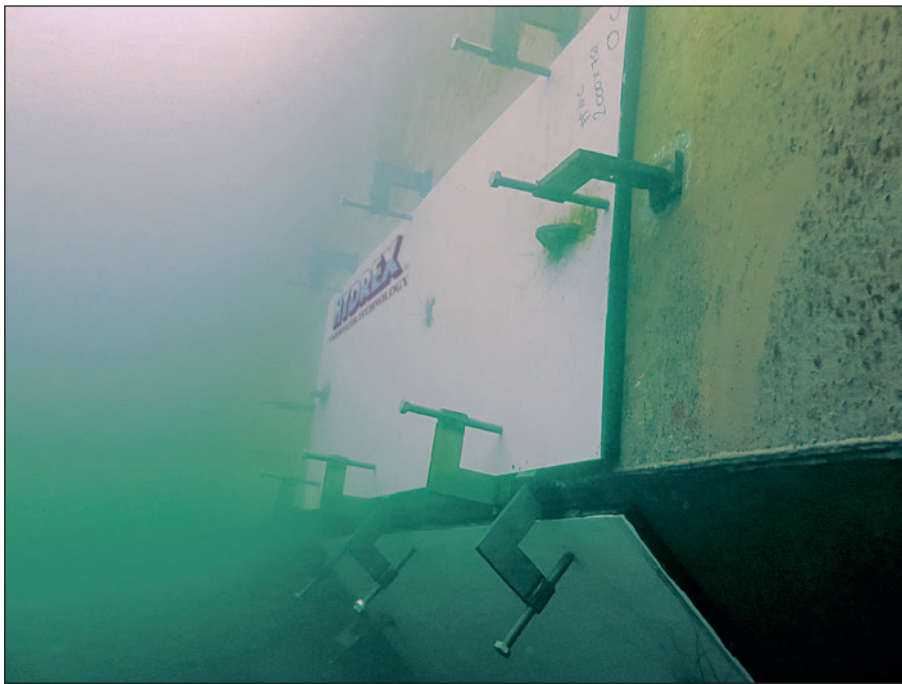
Along with the clean orderly spaces, equipment and vehicles, the strong sense of teamwork is a distinctive



The Antwerp fast response center is always orderly and well-maintained, contributing greatly to the overall achievement of top-quality work on every job.



A ship successfully repaired after a severe grounding, now safely in drydock for permanent repair.



Effective blanking makes it possible to carry out repairs and changes inside the ship without the need to go to drydock.

hallmark of Hydrex at the depot and on the job.

Planning, preparation

Timo Verhoegstraete, in charge of Technical Services, explains the

vital role played by his department in ensuring a top-quality result. Without the organization, planning and coordination, quality suffers. “Before the job can start we have to arrange everything including the necessary paperwork and permits,

transport of the team and the equipment, accommodations and local transport if it’s a longer, remote job, workboats and cranes if needed, as well as all the safety measures. We monitor the vessel’s arrival and departure time to make sure we have time to complete the job. During the job we are in constant communication with our team on site and with the client and ship agent and manager to coordinate everything. Team selection is part of every job and another key factor in obtaining a high-quality result.”

Jonathan concurs: “Preparation is everything. Preparation of equipment, preparation of materials and procedures.”

Procedures and training

Clément Paquet, a very experienced Senior Diver who has overseen





Successful seal repair leaves the stern tube as good as new with all leaks fully handled.

countless successful operations, says, “As long as everybody follows the procedures and adheres to Hydrex standards, then the quality will follow without fail. We have the people and know-how to deliver a high-quality product every time.”

Clément spent months writing up from experience the correct proce-

dures for all the key operations that Hydrex is asked to undertake. “When you’re doing pioneering work you’re always going to make some mistakes in the beginning before you fine tune the operation in the end.” The procedures now painstakingly written up by Clément and side-checked by Toon and Boud are the final result of distilling the best way to perform each operation. These procedures form the core of Hydrex Underwater Technology. New members of the team are trained on them and they are a key factor in delivering a high-quality result.

“Training is carried out constantly and is part of every job,” says Toon.

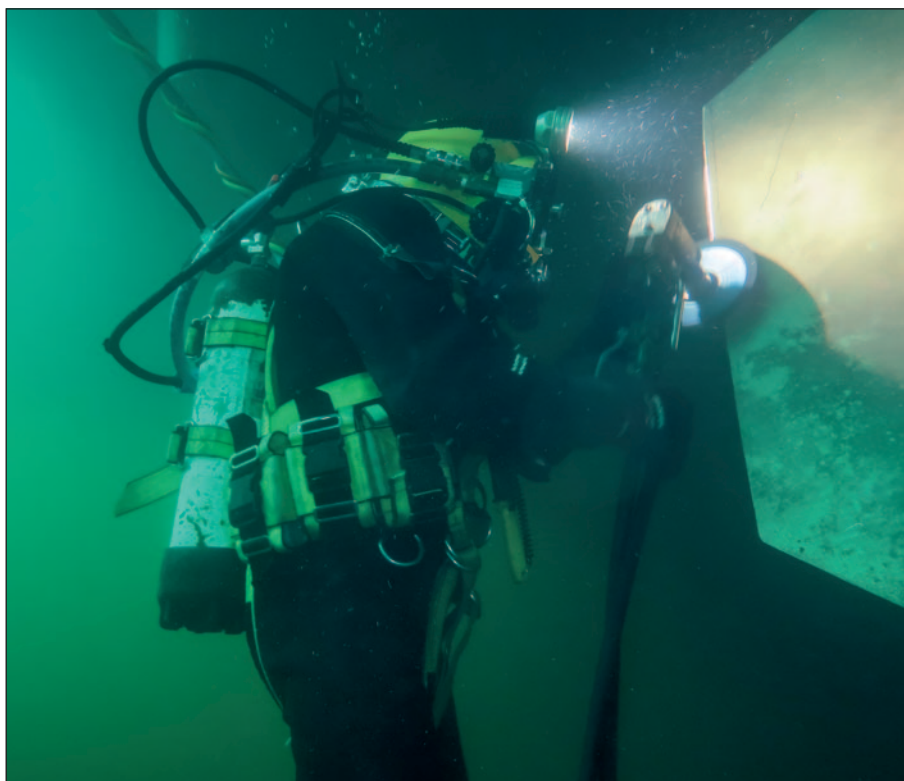
Delivery and final result

Clément also stresses preparation, particularly from the point of view of the Team Leader. “Before the job starts you have to have the correct information. Then you can make your assessment and plan before you

get on site. You must have the correct equipment and people with you. I always have a plan in my head already before I go ahead with the job. I try to teach the other guys too: before they start something, try to make up their mind about the exact steps for applying the procedure to that specific case. It makes the process easier once you’re busy because you already have the story written. On site you often have stressful situations due to lack of time and other factors. If you start on a job well prepared, then those things get easier. When the job is in progress, I try to oversee every step. I can monitor the divers’ actions by CCTV and correct where needed. At the end we make an overall CCTV inspection with the client there.”

Conclusion

Hydrex was founded with the purpose of delivering the highest quality of service possible at the highest speed, in order to keep ships in business and out of drydock. This purpose and accomplishment is what makes Hydrex stand out in a crowded marketplace today. ■



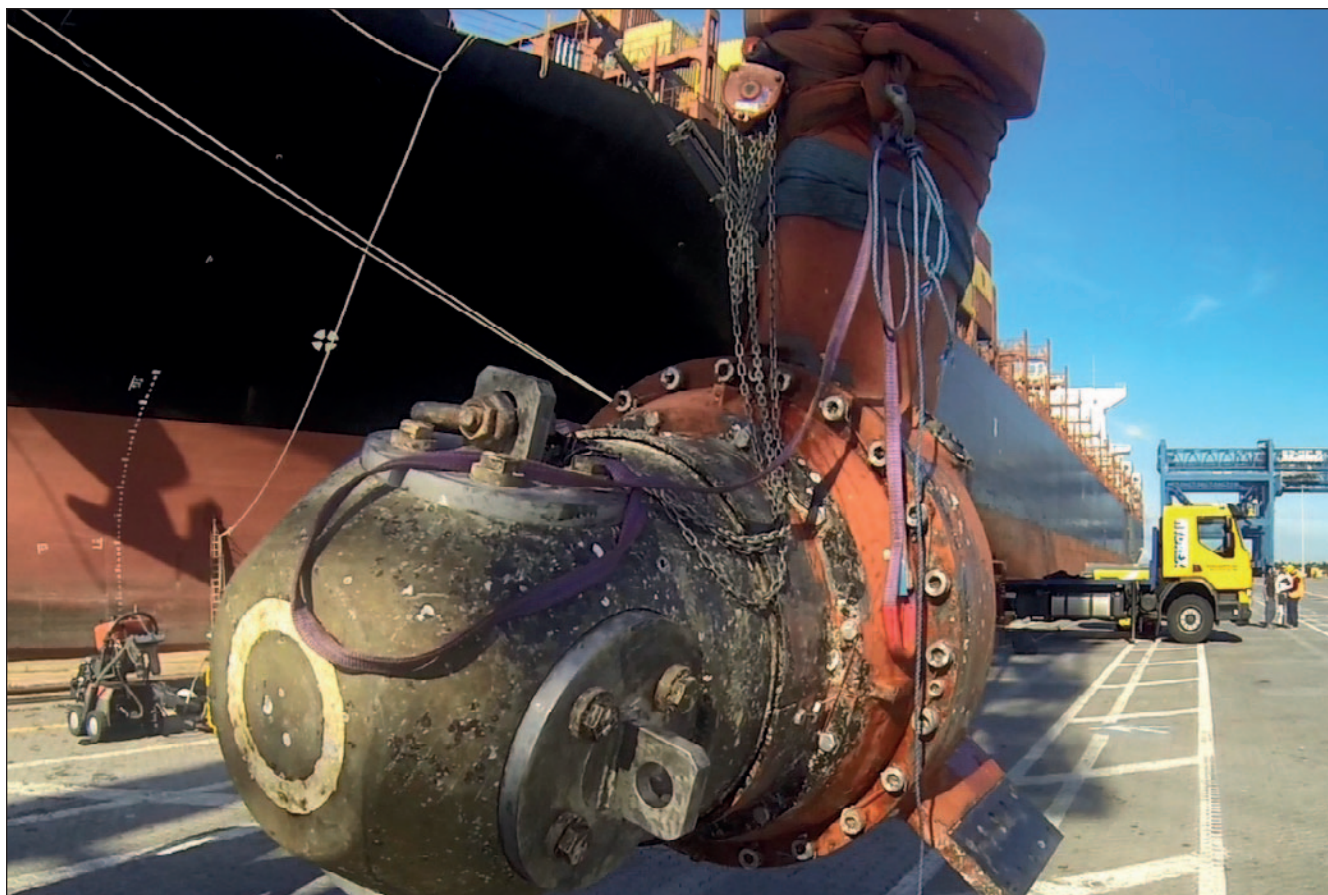
Propeller repairs are frequently required in order for a ship to continue operating efficiently until the next drydocking.

If you have received this magazine at the wrong address or if your company is going to move, please let us know.

You can
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or at
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**KEEPING SHIPS
IN BUSINESS**

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.

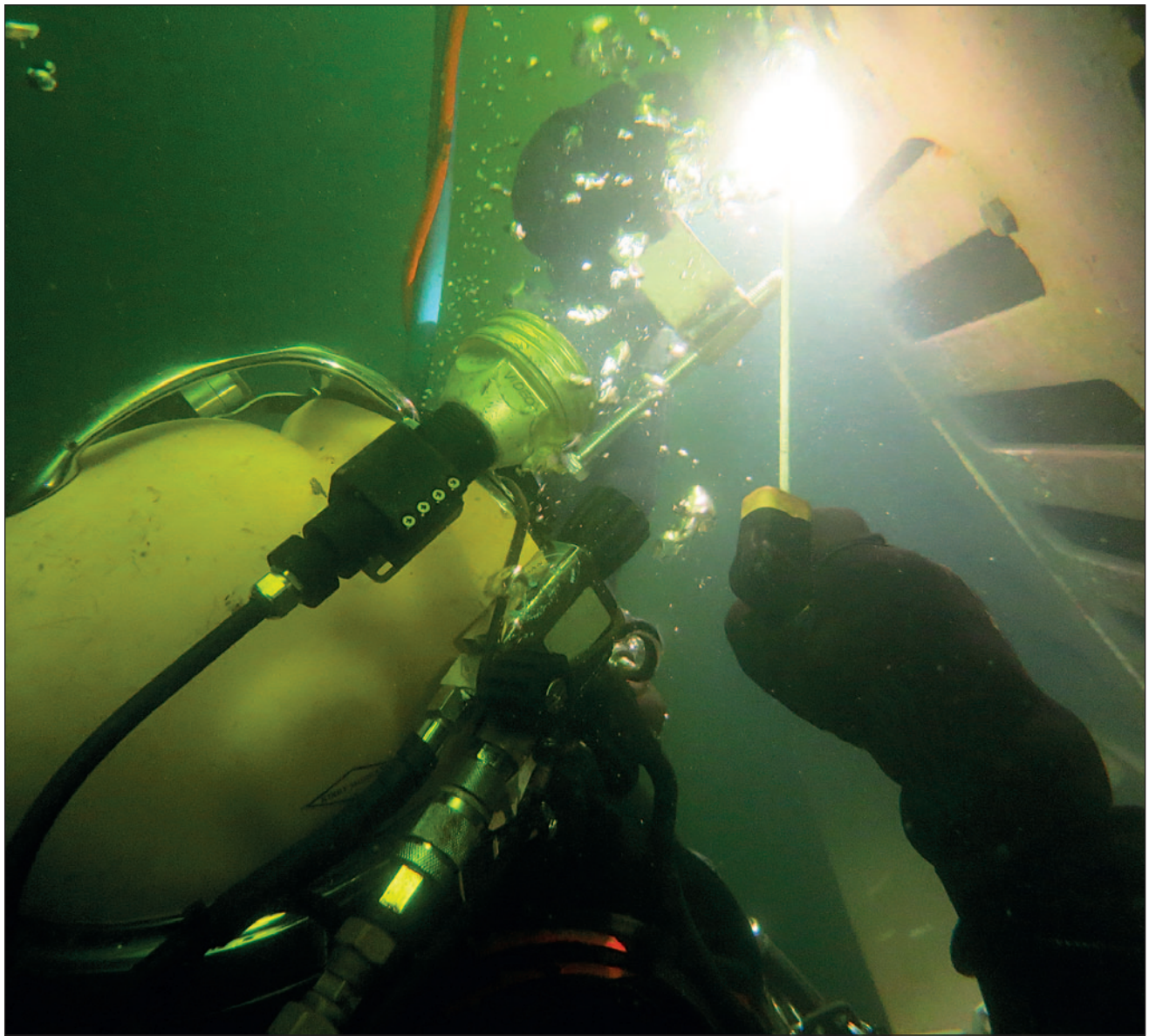
There is no need to send the vessel to drydock as all operations can be carried out in port or while the vessel is stationary at sea. Normal commercial activities can therefore continue without disruption.

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