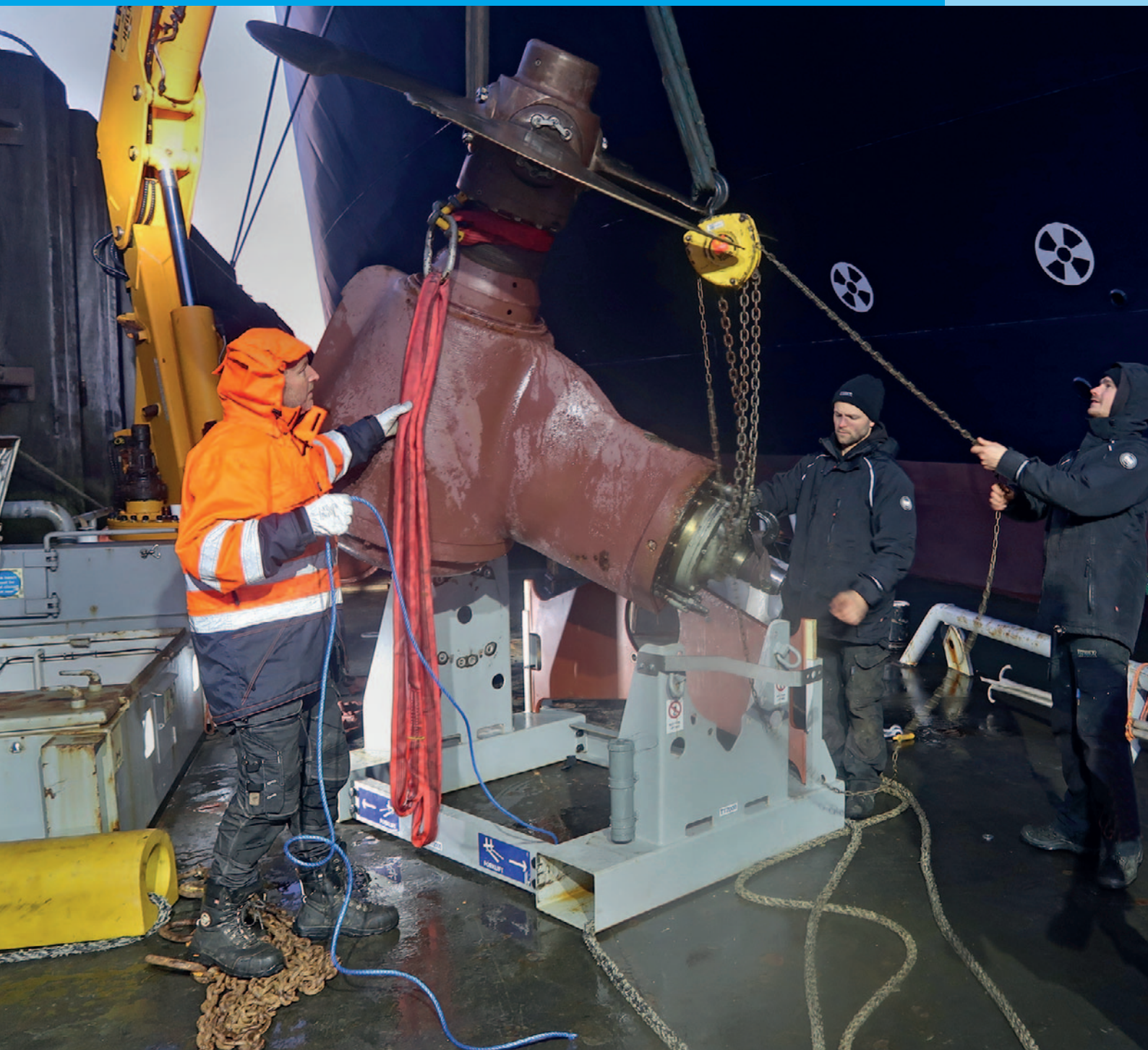




UNDERWATER TECHNOLOGY

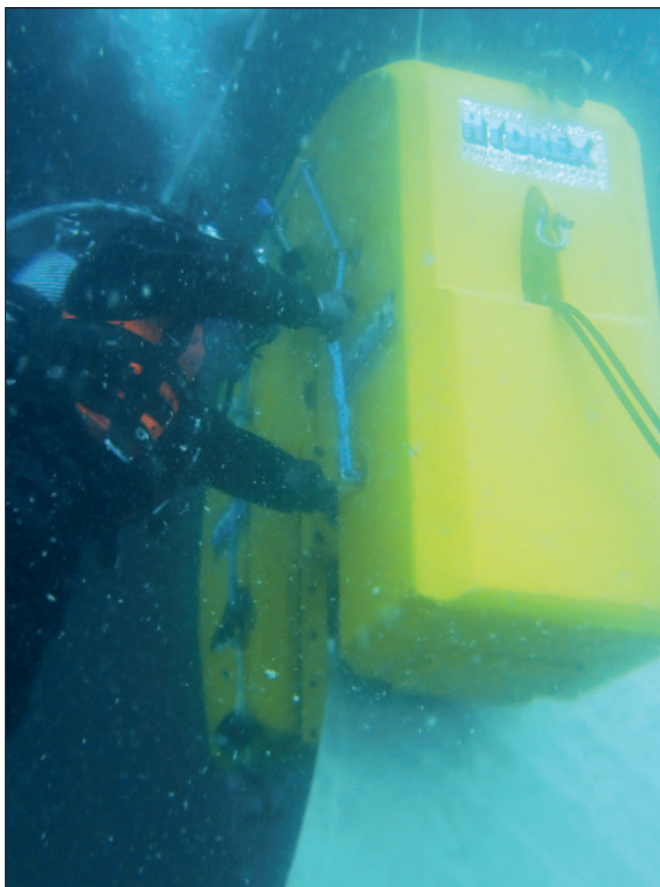
Magazine

Number 305



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Inwater propeller repairs



When damage to propellers occurs due to impact with ice and other debris we can help you, even if the damage is quite extensive. Our teams can restore the propeller's balance and efficiency.

By taking advantage of the in-house developed cold straightening technique, damaged blades can be straight-

ened underwater, allowing the ship to return to commercial operations without the need to drydock.

If straightening is not an option, the affected area of the blade will be cropped. This is done to achieve the greatest possible efficiency. Cropping is carried out using our propeller blade cutting equipment.

Our teams can also carry out any other repair work on the propeller. Examples of this are the removal and reinstallation of entire propeller blades or replacement of the propeller seal ring.

Contact us for more information on underwater propeller repairs. We are at your disposal 24/7.

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Editorial



In this edition of the Hydrex Magazine we decided to include an article on safety. We keep hearing from sources outside the company that we have a reputation for being the safest company in the business.

Looking at our record, it is true that in the close to 50 years of continued operation with thousands of jobs all over the world and in all conditions, we have never had a serious accident, let alone a fatality. Sensible safety measures are so much part of our culture and inculcated into the team, that we had to take a step back to examine why this is.

We have attempted to explain why diving at Hydrex is so safe in one of

the lead articles in this magazine. We felt it was important for you to know that when you entrust a job to us, you can be sure that safety for everyone involved is built in. Some consider diving and underwater work risky. We take the necessary steps to bring the risk factor way down so in many ways it's safer than crossing the street in some cities.

Hydrex founder
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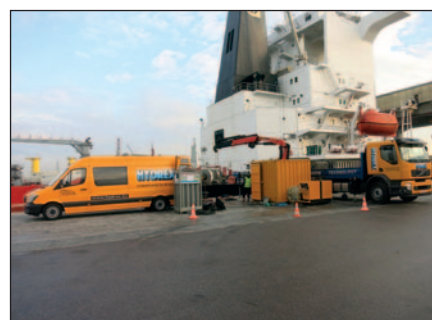
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Bow thruster replacement on roro ship in Rotterdam

Last month one of our teams replaced the bow thruster of a 191-meter roro ship during the vessel's stop in Rotterdam. Using one of our workboats, the diver/technicians carried out the operation on-site.

The team mobilized to the ship's location on the workboat loaded with all the needed equipment. Our 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.

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 divers first action was to take off the external thruster tunnel grids to provide access for removal of the old unit. Next pad eyes were welded inside the tunnel to hoist the thruster unit up and down.

The next step was to secure the gear-box with hoisting equipment. The team then disconnected the unit



Old thruster unit brought to the surface.



Old unit lowered onto cradle for transport.



Hydrex technician making preparations in the engine room.

from the engine room, removed it from the thruster tunnel and brought it to the surface.

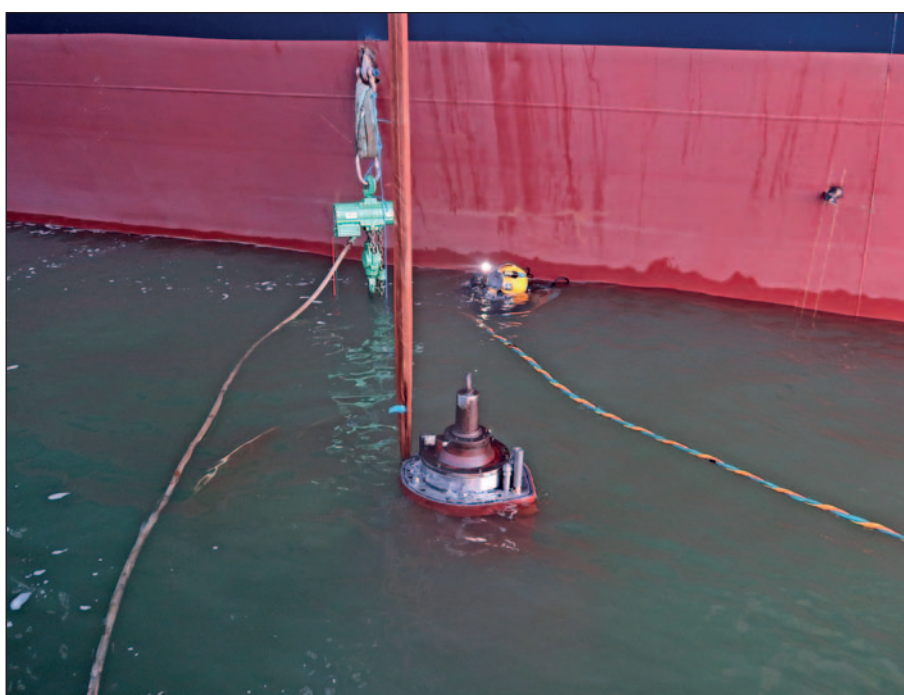
We carried out the operation in close communication with the OEM involved. They provided a new thruster unit and prepared it for installation on-site.



New thruster ready for installation.



Hydrex diver/technician handling thruster unit during operation in Rotterdam.



New unit lowered into the water.

Because the thruster was fully assembled and prepared, it could be installed in its entirety without the need to create a dry environment in the tunnel as is required when the blades are installed separately. Our diver/technicians lowered it into the water and brought it into the thruster tunnel. The team secured the unit and connected it to the engine room.

The operation ended with the removal of the pad eyes and the reinstallation of the thruster tunnel grids.

Conclusion

We assist shipowners with almost any problem they encounter with their vessel's thruster. A wide range of underwater repair or maintenance work can be carried out on all types of thrusters. An entire unit can be overhauled, propeller blades or seals can be replaced or repair work on a specific part of a thruster performed by our diver/technicians while the ship remains afloat.

By performing the operation in Rotterdam on-site and underwater our divers made it possible for the owner to keep the vessel out of dry-dock. Our team worked in shifts around the clock. They finished the job within the available time frame. This allowed the ship to sail on schedule, which was a key benefit for the owner. ■

If you have any questions regarding a possible bow thruster repair or any other underwater repair or maintenance job, do not hesitate to contact us. We are at your disposal 24/7 and ready to mobilize almost immediately.

**+32 3 213 53 00
hydrex@hydrex.be**

Scrubber pipe repairs and lasting protection



Exhaust scrubbers filter out all harmful toxins from exhaust gases of marine diesel engines. These hazardous pollutants can severely corrode the pipes of the scrubber. Using the experience we have accumulated over the years allows us to assist you at moment's notice if this happens.

We offer a full package to owners that are experiencing similar damage. Not only can we replace the corroded exhaust pipe while your vessel stays on schedule, but we can make sure that you will not have to call us again in a few months time for the same problem. This is done by coating the pipes with a highly

corrosion resistant coating called Ecospeed.

Contact us for more information on scrubber pipe replacements or other underwater repairs. We are at your disposal 24/7.

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An enviable safety record

Hydrex has been delivering high quality underwater repair and maintenance services continuously for nearly 50 years. A great deal of work has been performed all over the world in all seasons and conditions, often by large teams of divers and technicians. In all that time there has not been one single serious accident. This is a remarkable record. How has this been possible and why is it so much part of Hydrex's DNA?

Boud Van Rompay, Hydrex founder and CEO, came from a background of very successful cave diving, perhaps the most dangerous form of diving there is. He had survived more than his share of narrow escapes. But some of his close friends had not been so fortunate. The memory of seeing the parents of two friends after both had suffered fatal accidents in 1972 remains with him to this day. When it came to other people's lives, Boud was deter-



Toon Joos, Chief Diver, working in dry conditions on a stern tube seal inside a flexible mobdock, a Hydrex development for safe in-water stern tube seal operations.

mined not to take any risks.

"When I founded the company in 1974, my first action was to write a

safety manual," he recalls. "It covered all aspects of diving, commercial underwater work, how to manage divers, the size of the teams, what equipment to use, what to do, what not to do. When you're dealing with a team or a group, you need sensible rules that everyone can study and apply, so that you have a common agreement."

"Having and studying the rules and taking the whole job and the procedures seriously, prompts the individual in the team to become better and better with regard to safety," Boud continues. "The result for us has been almost 50 years without a serious accident."

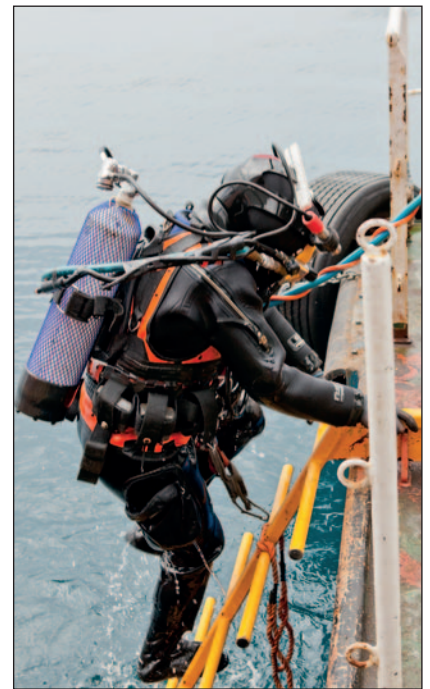
Boud feels that if a company has a poor safety record, it comes from irresponsibility, lack of clear rules or lack of respect for the rules.



The dive station on board a workboat used to monitor dive operations during a major underwater repair.



Lead Diver Clément Pâquet helps ready a diver to go in the water, personally checking that everything is correct before the start of the dive.



A diver coming out of the water after a successful underwater inspection (UWILD) in Algeciras.



Koen Smouts, Technical Preparation Officer, loads a truck in the Hydrex Antwerp depot in preparation for another job. Koen runs an extremely orderly and efficient depot which is vital to safe operations.

Companywide concern

At Hydrex, concern about safety runs through the entire company, not only with the divers.

Dave Bleyenbergh was a Hydrex diver for eight years before becoming a Technical Services Officer responsible for arranging the jobs and overseeing their successful execution. "Comparing safety at Hydrex with other companies, we are at the highest level," he says. He attributes this to a number of factors.

Not cutting any corners on equipment is one. "If you look at our equipment, it's new," he says. "If we have any doubt, it will be replaced. When you go into a company's depot and look at the shelves, you know immediately."

Another key factor is the divers, individually and as a group. Obviously the divers have to be qualified, but there is more to it than that. "We have created a solid group here at Hydrex and the individual's safety depends on this being maintained. You can have a good diver but if he

doesn't fit into the group here, it's a risk to the group's safety so we will not hire him."

Safety always takes precedence over financial or commercial considerations. "We won't take a risk because of commercial or time pressure," says Dave. "That is firm policy."

Personnel and equipment

Toon Joos, Chief Diver, has been with Hydrex for close to 20 years. In addition to acting as Team Leader on jobs, he is overall responsible for training the divers. "We have never had a major accident," he says. "It's down to selection, training and experience and the attitude of the divers who are willing to work safely."

"Having state-of-the-art, well-maintained equipment is also very important," says Toon. It is a point of pride for Hydrex.



Permanent in-water rudder repairs now possible without drydocking

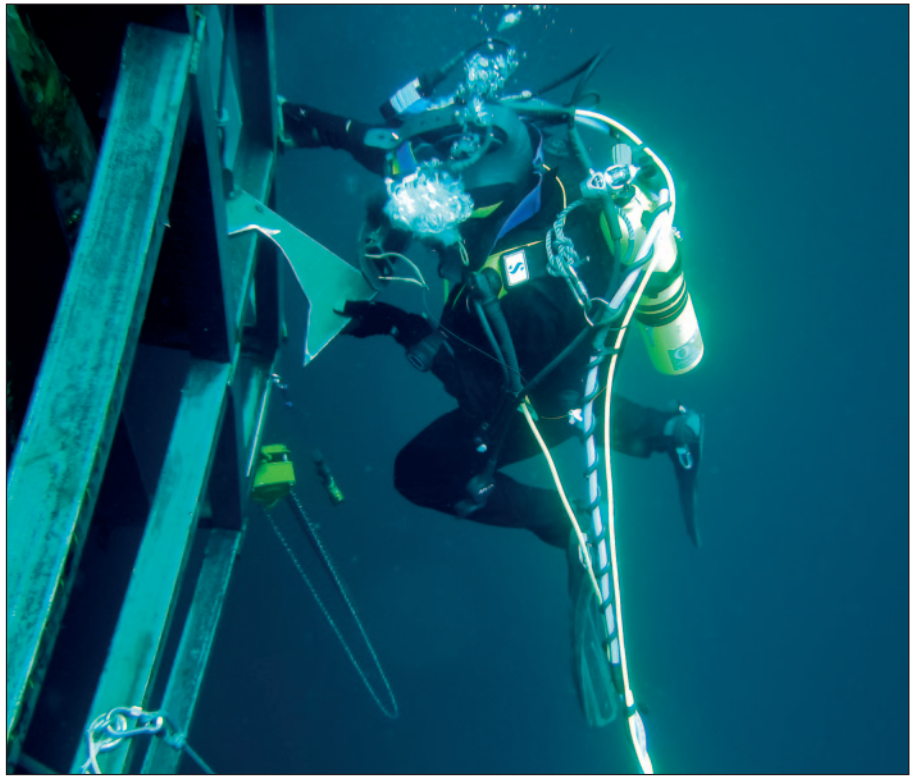


Hydrex has developed an entirely new method enabling permanent repairs of rudders without drydocking the ship. Permanent repairs were hitherto not possible and ships had to drydock in case a major defect was found. The newly designed equipment is light-weight and can be mobilized very rapidly in our special flight containers. Therefore this new service is now available world-wide.

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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A diver working on a major, complex underwater repair to the Eleftheria K, a Capesize-class bulk carrier that ran aground at the mouth of the Suez Canal.



CEO Boud Van Rompay goes over the final details of a job with Toon Joos, Chief Diver and Dave Bleyenbergh, Technical Services to make sure everything has been properly worked out before the job begins.

Koen Smouts, Technical Preparation Officer, is in charge of the depot and purchasing and maintaining all Hydrex's equipment including workboats, trucks and vehicles as well as diving gear. Everything is in its place, operational, clean and ready to deploy. His sense of order and his care for the equipment strikes you immediately when you walk into the Hydrex Antwerp

depot. "Part of my work every day is training the divers on the equipment, how to care for it and maintain it, how to work together as a team to repair something on site if it is broken," says Koen. "When I train them, I also always tell them why it needs to be a certain way." This all contributes majorly to the company's safety record.



Underwater welding by a well-trained and properly-equipped Hydrex diver.

Clément Pâquet, Lead Diver is another veteran who has been diving for Hydrex for almost as long as Toon Joos. “I have always felt safe as a diver here,” he says. “We try to keep the situation under control always, not leave things up to other people. When you have things in hand yourself, you can be sure it’s going to turn out properly. We have a discipline. If you know what you are doing, you can eliminate the risks. This comes mostly from experience.” On any job he goes on, Clément usually has the role of Team Leader. He goes on board to meet with the Chief Engineer and Chief Officer and ensure that safety measures are in place on the ship and that no one is going to turn the bow thruster on accidentally when they’re working in the thruster tunnel, for example. Then he holds a short meeting with the entire team

and makes sure everyone knows what they will be doing.

The attitude of management is important. “Management doesn’t push us, so we always have the time to do things safely and correctly,” says Clément. “It’s not always easy, because sometimes we are working on a tight schedule, but if something is not safe, we do not start.”

Henri Allard is a First Diver who came to Hydrex in 2016 after working at another dive company. “I feel very safe as a diver here,” he says. “Everybody is concerned about maintaining the dive helmets and equipment in general, doing checks and yearly maintenance. If something is broken it gets reported immediately. I also feel safe as far as the other team members are concerned. Except for the student

divers, I can rely on everybody. And the student divers just need to learn – they rely on me.” Henri makes sure that the divers he is responsible for are properly equipped and that procedures are followed. “That’s my responsibility as First Diver,” he says.

“I hear from freelancer divers that Hydrex is one of the safest companies to work for,” adds Henri. “We are known for having the best equipment and that Hydrex is safety-conscious and efficient.”

Manuel Hof is in charge of quality control and compliance at Hydrex. “We have a Safety Assurance System,” he says. “This includes VCA





Manuel Hof, in charge of Quality Control at Hydrex, with a plaque for 25 years of quality excellence from Lloyd's Register Quality Assurance (LRQA).



First Diver Balder Deliaert making sure that the dive suit, helmet and gear are correct in every detail before sending Third Diver Yente De Cock into the water for a cofferdam installation in Rotterdam.



Safety is just as important during dry work inside the ship as under the water when diving. Here, one of our Third Divers grinds a bevel on the hull of a ship prior to a full penetration weld to install a scrubber outlet pipe.

external certification which is local to Belgium and the Netherlands. We also have our own diving standards and procedures. The maintenance of diving gear is really strict. The main point is to avoid accidents, not wait until there is a problem and then see how we can solve it.”

In addition to the lengthy list of requirements, on-board safety measures, training of the divers, pre-dive checks and equipment maintenance checks, Manuel explains, “It’s really important that management, team leaders and the person responsible for the depot, really encourage the divers to work in a safe way. If they don’t set the example, then the other divers will not follow the rules as, apparently it’s not that important.”

Team effort

One of the main reasons for Hydrex’s enviable safety record is the attitude that pervades the group from top to bottom that safety is a chief concern. Another important factor is the willingness to work together to follow the rules that have been developed from experience over the years. ■

Contact us for more information on underwater repairs. We are at your disposal 24/7.

**KEEPING SHIPS
IN BUSINESS**

Underwater propeller cone fin installation offers immediate fuel saving

We regularly install propeller cone fins on different types of vessels. We can carry out these operations all over the world.

A direct result of this underwater operation is that an owner can instantly start benefitting from the fuel savings a propeller cone fin brings. He does not have to wait until the next scheduled drydocking for the installation.

Propeller caps like these can recover energy loss of a propeller hub vortex in the propeller's slipstream. This decreases fuel consumption from 3% up to 5% according to the manufacturers and reduces cavitation on rudders and hulls. Hydrex can install propeller cone fins underwater on any size and make of propeller, on both new build or in-service vessels.

Installation afloat prevents a long wait for fuel savings

We carry out these operations following the specific procedures required by the involved OEM, adapted for an underwater installation.

After a preliminary inspection the divers remove the propeller cap and clean the flange where the device is to be installed. They then lower the propeller cone into the water and position it on the propeller. The bolts are put on the correct torque and secured. Hydrex teams can work in shifts around the clock to finish the operation as quickly as possible.

The owner of the vessel can start enjoying the fuel savings the propul-



Preparing a propeller cone fin for installation.

sion improving device creates right away. Not having to wait for the

next scheduled drydocking to have the propeller cone fin installed can



Hydrex workboat next to container vessel during propeller cone fin installation.

Hydrex under-water inspections

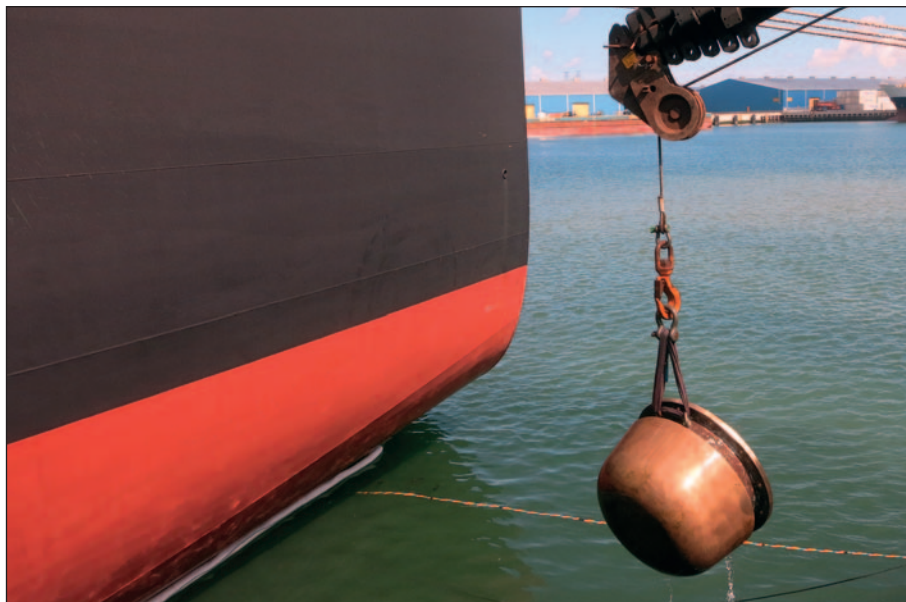


Underwater inspections are an essential aspect of ship repairs. Building upon conventional technical skills and know-how while also taking advantage of the latest technology, Hydrex offers a unique hull monitoring service to its customers. This gives ship owners total control of the underwater hull and 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.

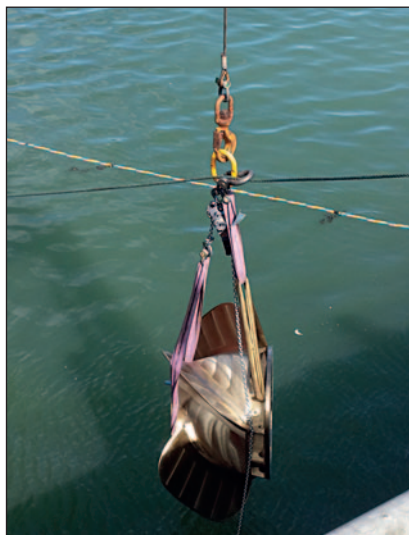
Hydrex diver/technicians can carry out inspections underwater and on-site very swiftly without disturbing the vessel's sailing schedule.

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.

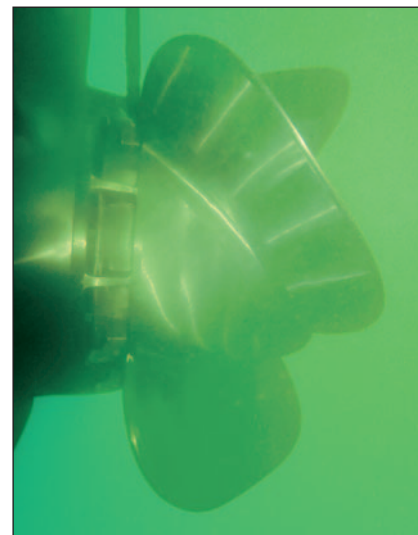
Our diver/technicians are trained for a wide range of operations and they can carry out the inspections in port or at anchor anywhere in the world.



Removing the old propeller cap.



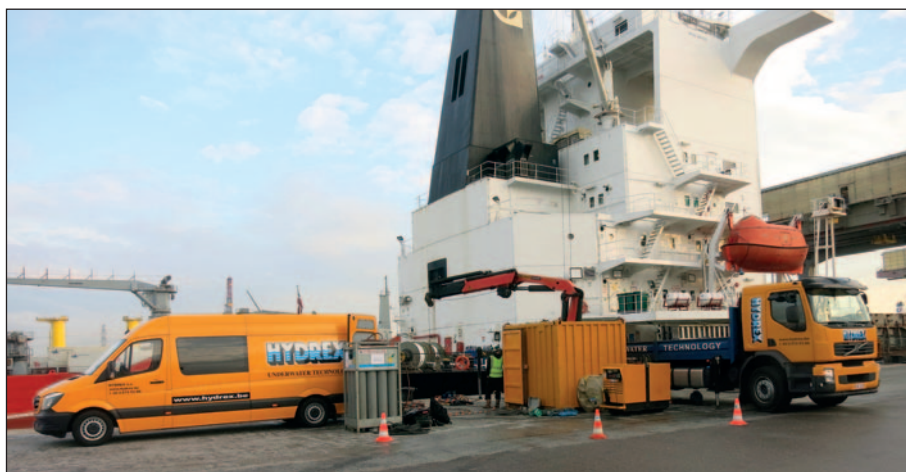
Lowering the new propeller cone fin into the water.



Propeller cone fine brought into position.

win him up to four years of fuel savings. In contrast, he will have earned back the cost of the under-

water installation in only a few months. The savings are considerable. ■



Hydrex vans and equipment next to general cargo vessel.

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.

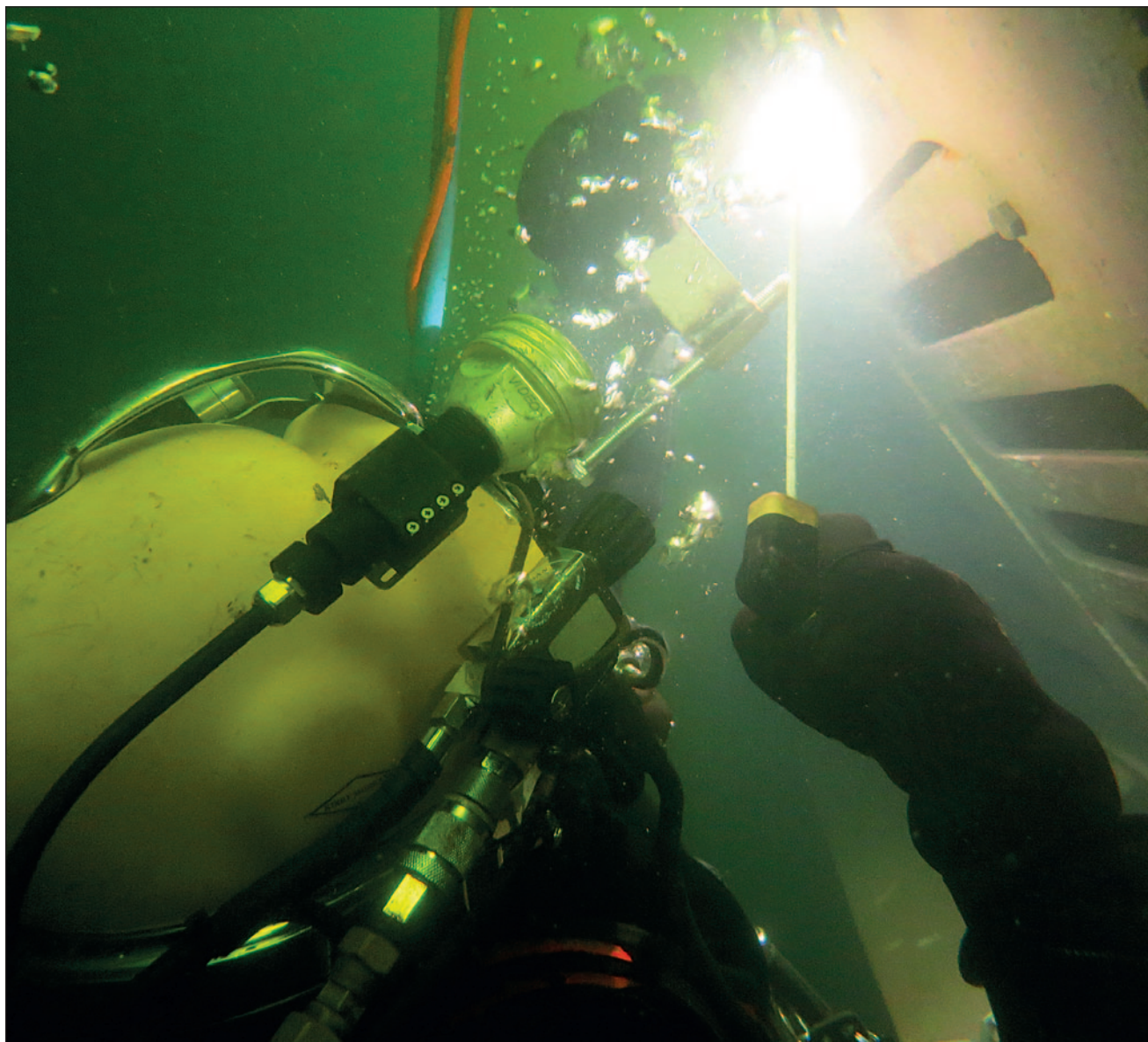
Visit the special stern tube seal repair section on our website for more information and examples of the many seal repairs we have performed in recent years.

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Sail safe with Hydrex



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