



UNDERWATER TECHNOLOGY

Magazine

Number 299



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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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UNDERWATER TECHNOLOGY

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Editorial



Welcome to the last Hydrex magazine of 2021. We wish you all the best for the Holiday Season and the coming year.

Our diver/technicians have been very busy throughout the entire year and still are. At the time of writing we have a large team in Egypt performing a complex operation on a bulk carrier. An article on this repair will be published in one of the upcoming magazines.

We also have teams on the road in France, Israel, Spain and several ports in Belgium and the Netherlands. They are carrying out a wide array of repair and maintenance operations, always to the same high quality we are known for.

Rest assured that we will be ready to assist you 24/7 in 2022, as we have been since Hydrex was founded in 1974. Do not hesitate to call us when you need any repair or maintenance work performed. We have the means and knowledge to provide you with a fast, underwater solution which will save you the time and cost of going to drydock.

Hydrex founder
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ISO 9001 certified

Underwater services and technology approved by:



**BUREAU
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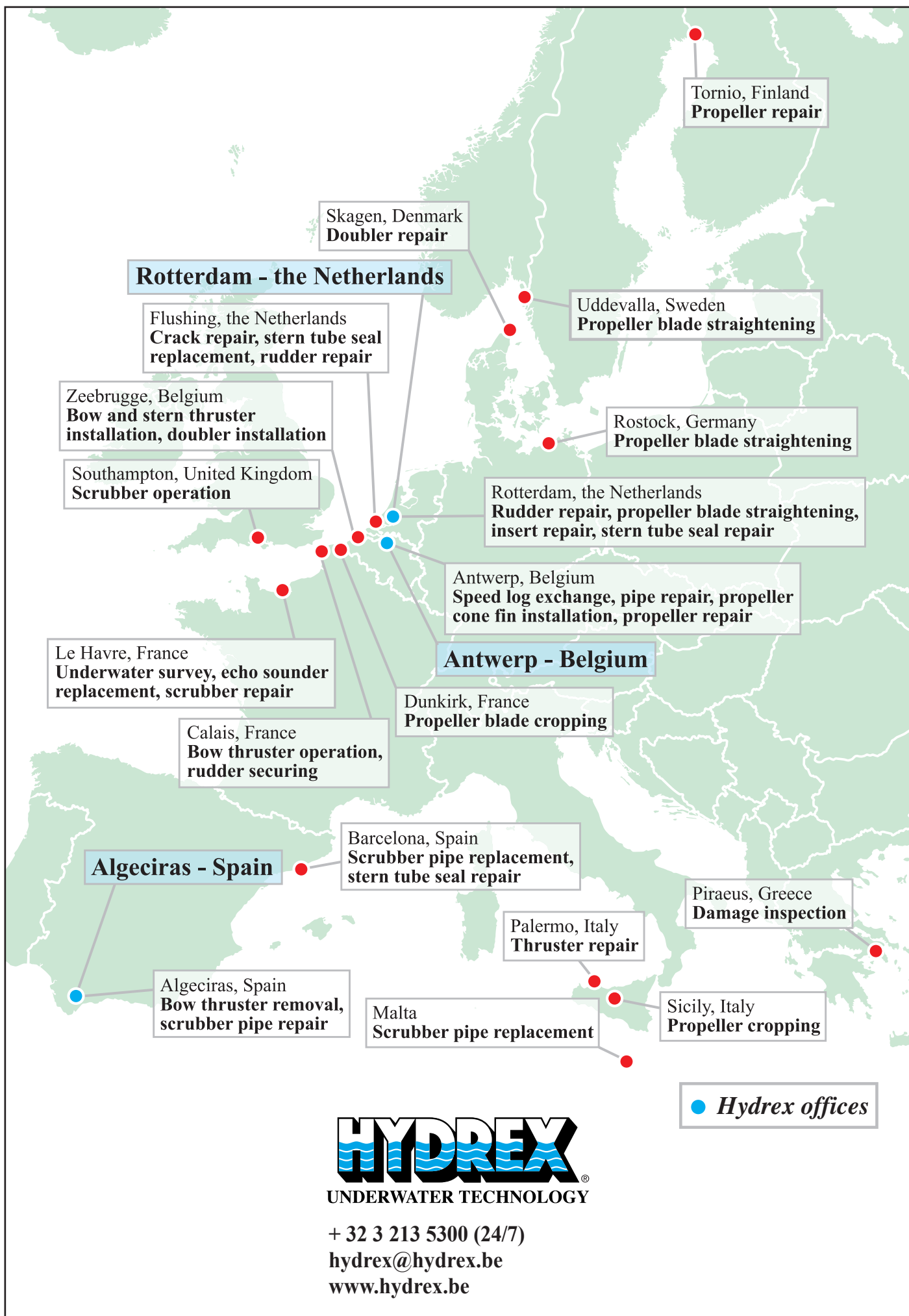
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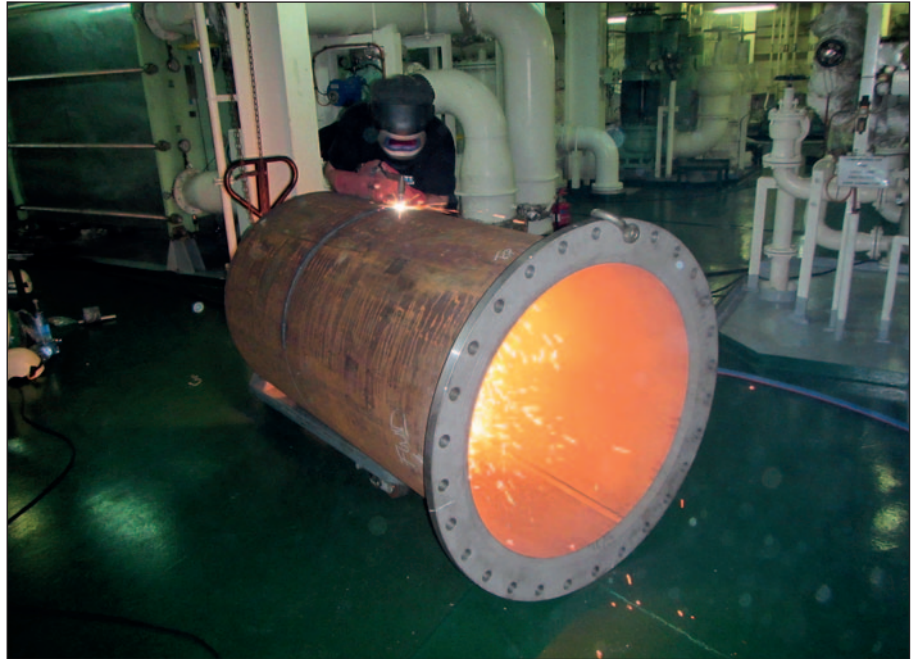


Wide range of underwater operations across Europe

At Hydrex we are available at all times. We know how important it is to have a resource you can rely on whenever you need to. Therefore, our teams are ready to mobilize on an immediate basis to locations across Europe, from Scandinavia to the Mediterranean.

We offer maintenance services and repairs on all parts of the underwater ship's propulsion systems and the hull. Operations are class approved and carried out alongside or at lay-by berth while commercial activities continue. All this is done with qualified and experienced diver/technicians, state-of-the-art equipment and advanced techniques.

Our teams can perform a wide range of underwater services. In fact, almost any underwater part can be repaired while the ship stays afloat. This not only allows you to keep on-



Preparing new scrubber pipe for installation in Algeciras.

schedule but also reduces downtime or even eliminates it completely.

This year we carried out a wide range of underwater repairs all across Europe. These operations included a speed log exchange and

propeller repairs in Antwerp, rudder repairs, and stern tube seal repairs in Rotterdam, a bow thruster removal and a scrubber pipe repair in Algeciras, a sea chest repair in Civitavecchia, thruster repairs in Palermo, propeller repairs in Tornio, a propeller cropping in Sicily, doubler plate repairs in Skagen, bow thruster and rudder operations in Calais, scrubber pipe replacements in Malta, a propeller blade straightening in Uddevalla, a stern tube seal repair in Barcelona and many more.

Please contact us if you want further information on these operations or on any other kind of underwater service you require. We are ready to respond at very short notice. ■

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Tailor-made cofferdam on drill ship in Palermo.



Hydrex ready to assist you during the Holiday Season

The Holiday Season is upon us 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.



Harsh conditions do not stop our dive teams.

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. ■

**KEEPING SHIPS
IN BUSINESS**

Scrubber pipe repairs and lasting protection



Exhaust scrubbers filter out all harmful toxins from exhaust gasses 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.

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

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Underwater re

Seal repairs

We have developed a reliable technology that enables the underwater replacement of all types and sizes of shaft seals.



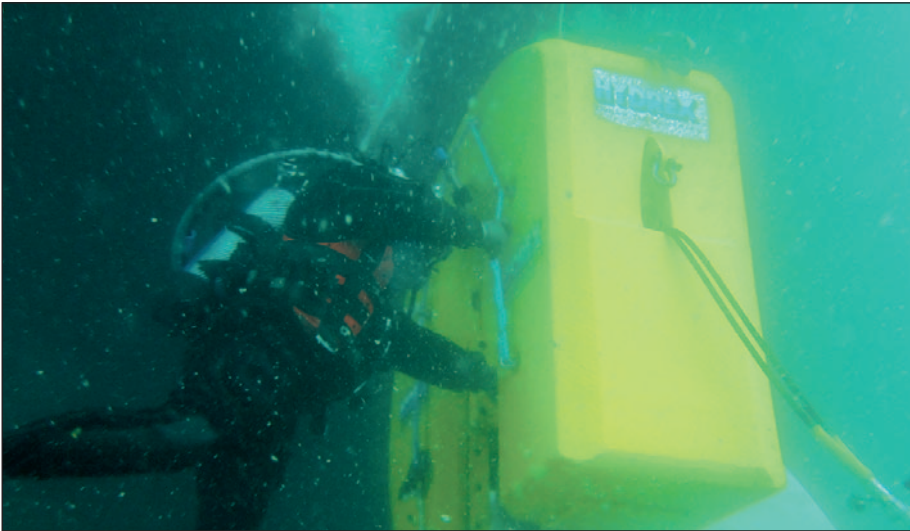
Thruster repairs

We can assist shipowners with almost any



Propeller repairs

When damage to propellers occurs due to impact with ice and other debris we can fix these, even if the damage is extensive.



Rudder repairs

We can perform permanent repairs on any rudder damage during anchorage and cargo operations continuing



Underwater maintenance

Inspections

We offer a full range of hull monitoring services including IWS and class inspections. This gives owners total control of their ship's hull condition.

Propeller buffing

We developed an efficient technology to enhance propeller blade surfaces underwater and achieve surface conditions never seen before.

Anode installation

We can install both ICCP and sacrificial anodes. If needed we can supply the anodes.

Repair solutions

any problem encountered with thrusters.



Hull repairs

Our on-site hull repair services include the renewal of both small and large areas of damaged hull plating.



any type of rudder while the vessel remains
ue.



Scrubber repairs

We can assist shipowners at moment's notice when a scrubber pipe corrodes and needs replacing.



Transducer installation

Our teams can very quickly replace or install speedlogs and echosounders without any hindrance to a ship's schedule.

Blanking

We can blank overboard valves, inlets, seachests or any other underwater opening to allow for onboard repairs. This is done very quickly and on-site.

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Grade A wet welding certificate

We can carry out classification certified grade A wet welding. To guarantee the required high standard of these underwater welds, NDT tests were performed by ABS surveyors before the certificate was awarded.

The certificate was given to carry out grade A *groove welding* underwater. Cavitation or corrosion damage on rudders, clad welding, rope guard repairs, mewis duct repairs, ... can now be done with permanent welding.

With a class B weld an inspection of the weld is required every three months. With class A welding the deadline for an inspection is much longer. This is decided by the attending surveyor on a case by case basis.

Any required inspection will be for the underlying problem causing the damage and not for the welding work. An internal structural problem causing damage will not always be handled after the repair and will need to be followed up. For instance, doubler repairs can never be permanent because the doubler is installed over the damaged plating instead of replacing it (as is the case with insert repairs).

With class A underwater welding only a note is made stating that the affected area needs to be looked at during the next scheduled inspection. This is very important for tankers as a clean class certificate is requested by most charterers.

Even for non-class items such as rope guards the certificate is useful because it shows our customers that



We have received the approval to carry out classification certified grade A wet welding.

our diver/welders can carry out high quality underwater welding work. This is a major benefit for offshore units where high quality standards

need to be verified before welding operations like doubler repairs can be performed. ■



Weld seams of doubler plate installed over damaged hull area.

The real value of underwater inspections

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 their ship's hull condition and consequently its performance, with only a minimum of work on their part.

Underwater inspections represent a small investment and, if properly done, have the potential to save an owner a great deal of money.

Competent underwater inspections, particularly if carried out regularly can detect

- Problems with the propeller such as bent or damaged blades (which can put undue strain on bearings), roughness due to fouling, cavitation damage or bad polishing which can reduce the propeller's efficiency.



Hydrex diver/technician during the inspection of a stern tube seal assembly.

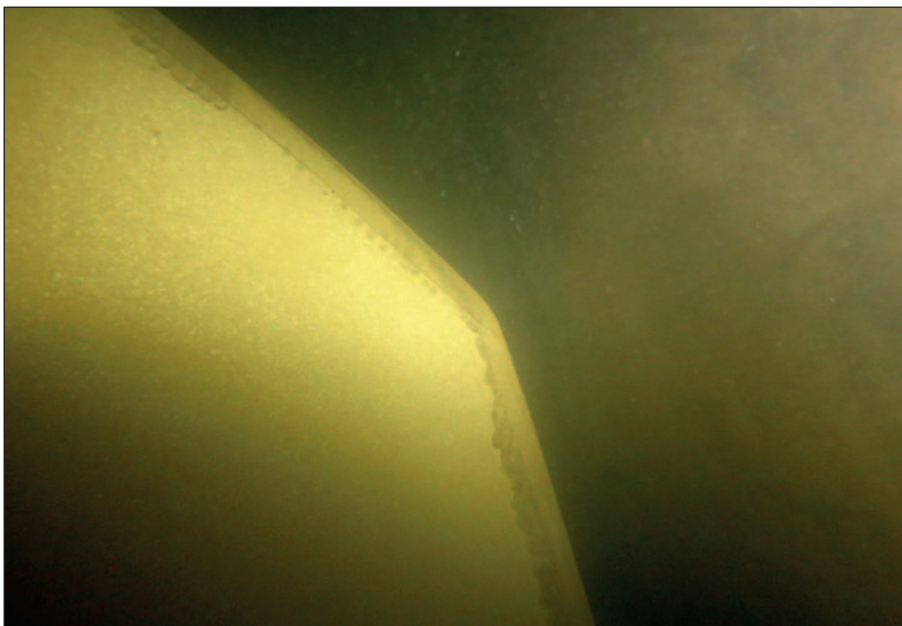
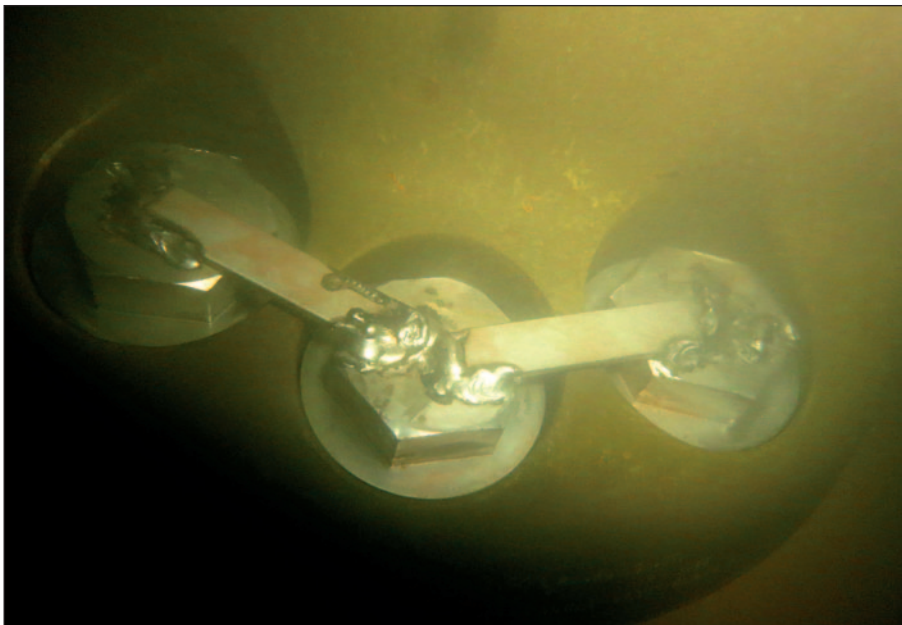
- Anodes which have wasted away, rendering the cathodic protection system unworkable, leading to corrosion and added hull friction.
- Hull cracks or other damage which, if not rapidly arrested, can worsen and increase the cost of any subsequent repair.
- Ropes inside the stern tube

assembly which may cause seal problems if neglected.

- Leaking stern tube or thruster seals which can cause an environmental problem in port and lead to costly changes to a ship's schedule if not caught quickly and repaired.
- Clogged sea chest grids (preventing proper cooling of the ship's engines), or loose or damaged grids.
- Loose or broken grids on thruster tunnels which can result in damage to thruster propellers.
- Damaged, bent, broken or detached bilge keels which again can become much worse if not caught early.
- A damaged rudder which will continue to deteriorate if not addressed rapidly, resulting in the need for much more costly repairs and representing a safety hazard in extreme cases.



Hydrex team arriving next to a ferry in Calais for a bow thruster inspection with a very short window.



All three bow thrusters were inspected in the short time before the ferry had to sail again.



Hydrex divers are experienced in both maintenance and repair operations.

Regular inspections carried out by competent divers and followed by comprehensive and accurate reports can detect any of these or other problems so that they can be corrected early and prevent the more costly repair which neglect and further damage would incur.

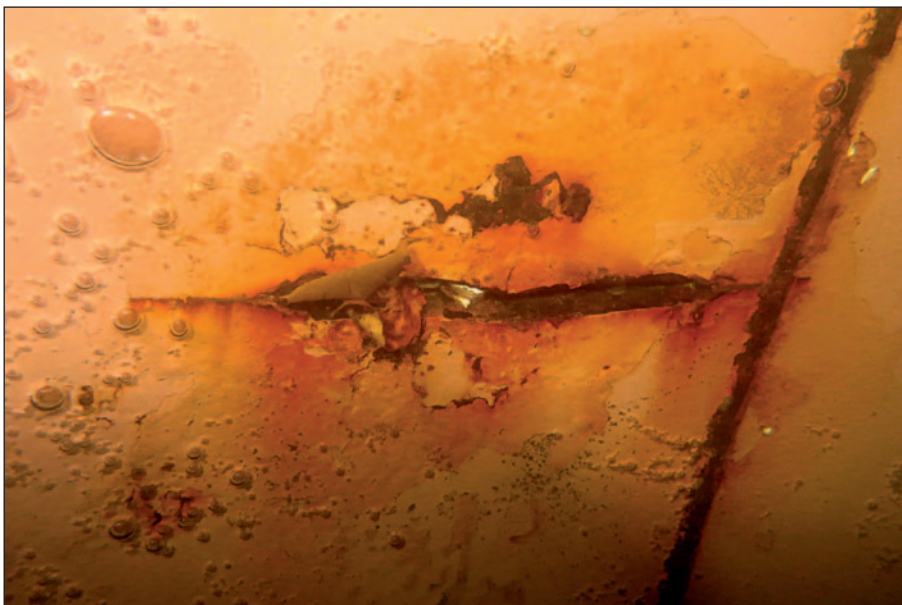
Because we have 47 years of experience in both maintenance and repair services, we can carry out any required follow up repair very fast without any unnecessary loss of time. Planning in a new slot is not needed as all our diver/technicians are skilled to perform the repair work as well.

If the damage found during an inspection can be anticipated, the required equipment can be mobilized in advance. Otherwise it can be transported to the location of the vessel immediately from one of our fast response centers where a large stock is available for our teams at all times.

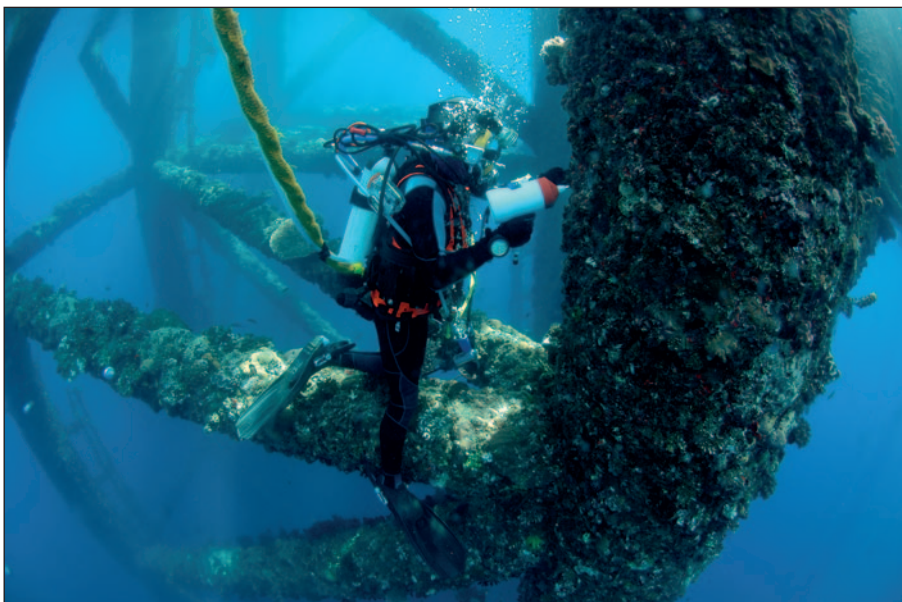
This was demonstrated when a rope guard had come loose, which was revealed during an underwater inspection. The Hydrex team secured the rope guard without any delay for the owner.

Inspections before dry-docking

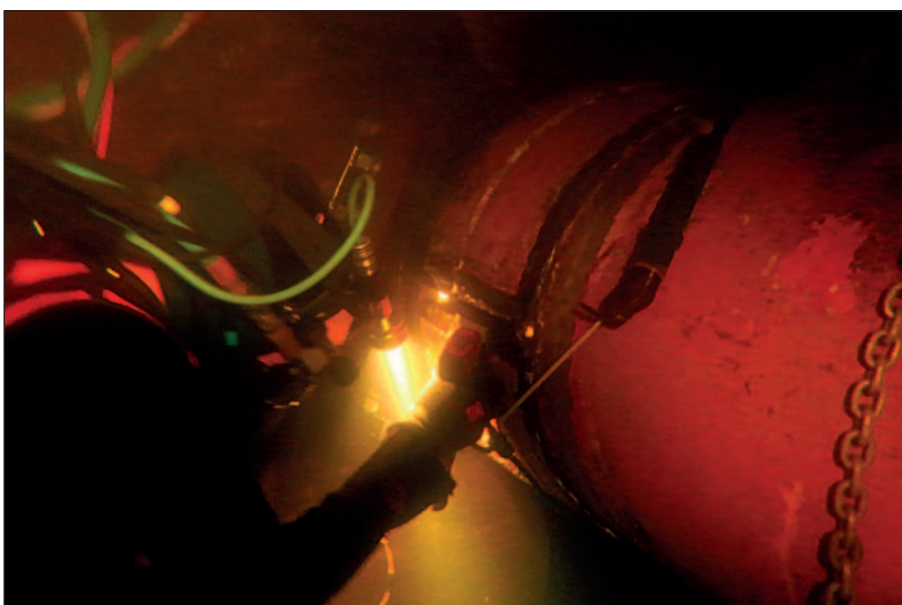
There is another important way for underwater inspections to be used to save costs. A thorough inspection carried out a week or two before a ship is due to go to drydock can save a great deal of money in drydock. An accurate estimate of work required can lead to efficient scheduling. If thrusters are to be repaired in drydock they can be removed prior to the ship's drydocking and can be repaired and ready for reinstallation when the ship is in dry-



If damage is found during an inspection, our team can offer advice on possible repairs and carry these out.



We can carry out inspections for the shipping as well as the offshore industry.



Hydrex diver working on the rope guard.

dock, rather than waiting until the docking to find out and then having to extend time in drydock in order to repair and replace the thruster.

An accurate report on the state of the rudder can lead to effective repair and recoating of the rudder so that it does not suffer further damage.

The all-too-frequent scenario of a low estimate for drydocking which grows exponentially once the drydock gate has closed and the ship is out of the water can thus be avoided.

Easy to combine with other operations

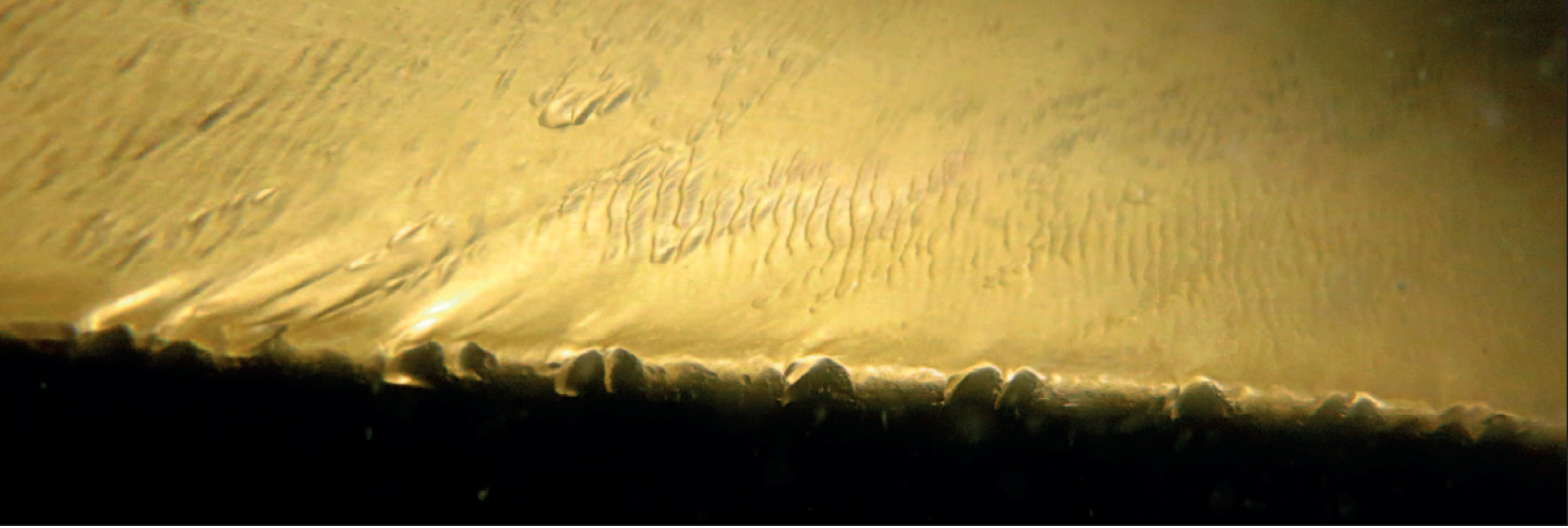
Because an underwater inspection is a small operation, it can be combined with one or more other operations very easily. This can be another maintenance operation like a propeller buffing or any type of repair job.

By doing this, the shipowner is saved the hassle and cost of multiple mobilizations and possible delays to his vessel's sailing schedule.

Speed is of the essence

Hydrex diver/technicians can carry out inspections underwater and on-site very swiftly without disturbing the vessel's sailing schedule. A good example of this are the inspections of the bow thrusters carried out on two ferries in Calais. Because of the nature of these vessels, the time frame was extremely short. Both times all three bow thrusters needed to be inspected in the small window available. A change to the schedule was out of the question as it would do great harm to the reputation of the owner.





An inspection will give a shipowner a perfect assessment of any damage, so that he can take an informed decision on what to do.



Hydrex team leader monitoring an underwater operation.

We have always put great effort into minimizing the impact of our services to the schedule of a vessel. Our teams are trained to adapt themselves to the agenda of the ship and not the other way around. ■

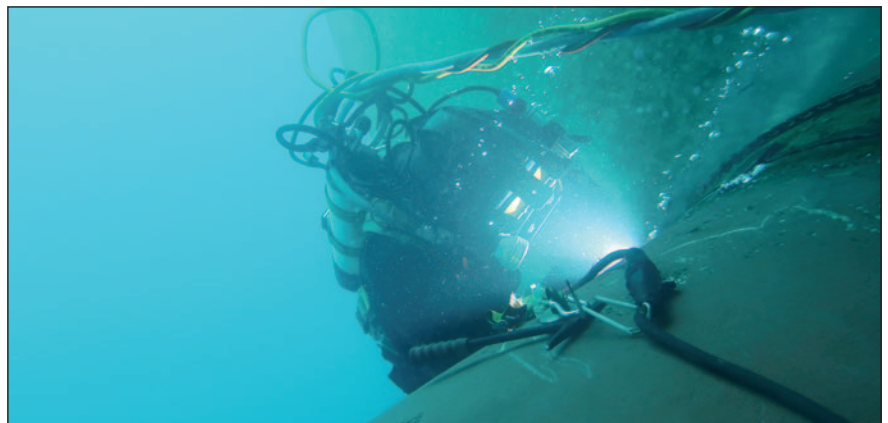
**KEEPING SHIPS
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Stern tube seal repairs

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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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.

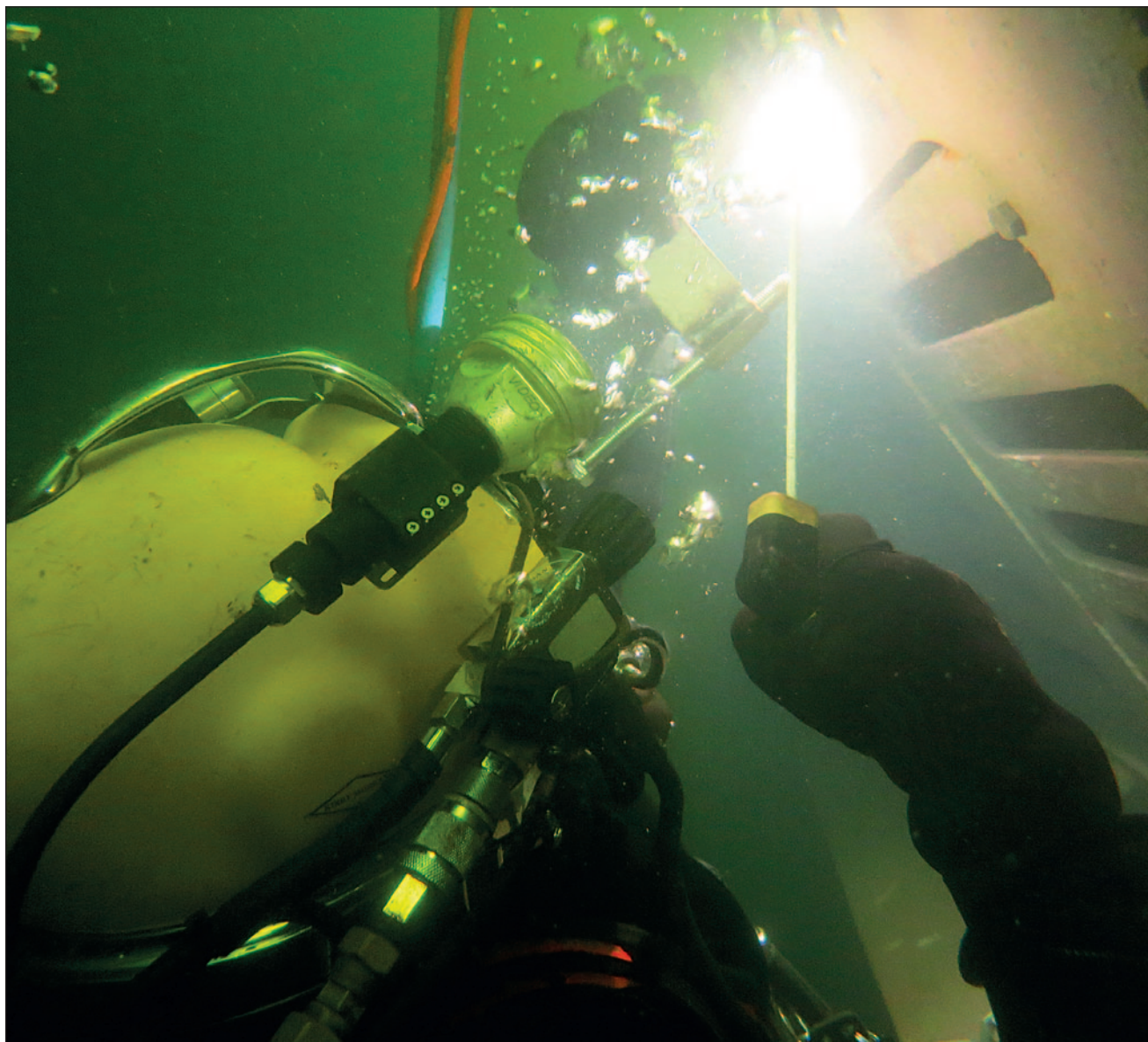
There is no need to send the vessel to drydock as all operations can be carried out in port or while the vessel is stationary at sea. Normal commercial activities can therefore continue without disruption.

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Sail safe with Hydrex



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