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KEEPING SHIPS IN BUSINESS

ISO 9001 certified

Underwater services and
technology approved by:



**BUREAU
VERITAS**



ClassNK



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.

HYDREX[®]

UNDERWATER TECHNOLOGY

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High quality underwater repairs by trustworthy professionals

When we send a team to an operation, *any operation*, we have one goal in mind: to get the job done in the shortest possible time and to the highest standards. This has been our policy since Hydrex was founded in 1974. Our track record proves that this is not a false claim.

Turning divers into specialists

We want to offer the highest quality of service for our customers while at the same time guaranteeing the safety of our divers at all times. To achieve this we need staff who have familiarity with a wide range of operations as well as the relevant know-how. Our diver/technicians are trained and qualified to perform all class-approved repair procedures in even the harshest conditions.

This is a result of the stringent train-



We have a large fleet available for immediate mobilization, including workboats, vans and trucks.

ing all divers go through. Whether they work for the Hydrex main office in Antwerp or for one of the other offices. They are required to have internationally accepted commercial diver certificates and

take high standard external courses, including safety and offshore courses. Besides this they also receive comprehensive in-house training.

Training consists of both theoretical classes and practical drills on the Hydrex premises. There they have access to a wide range of underwater tools and various other equipment, including three dive trainings tanks in which underwater welding and other repair work can be practiced.

In addition to these classes, new divers also get the opportunity to assist experienced Hydrex diver/technicians during operations. The training enables them to become experienced divers and technicians themselves and to take advantage



Our teams perform underwater repairs without unnecessary loss of time, quality or safety.



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.

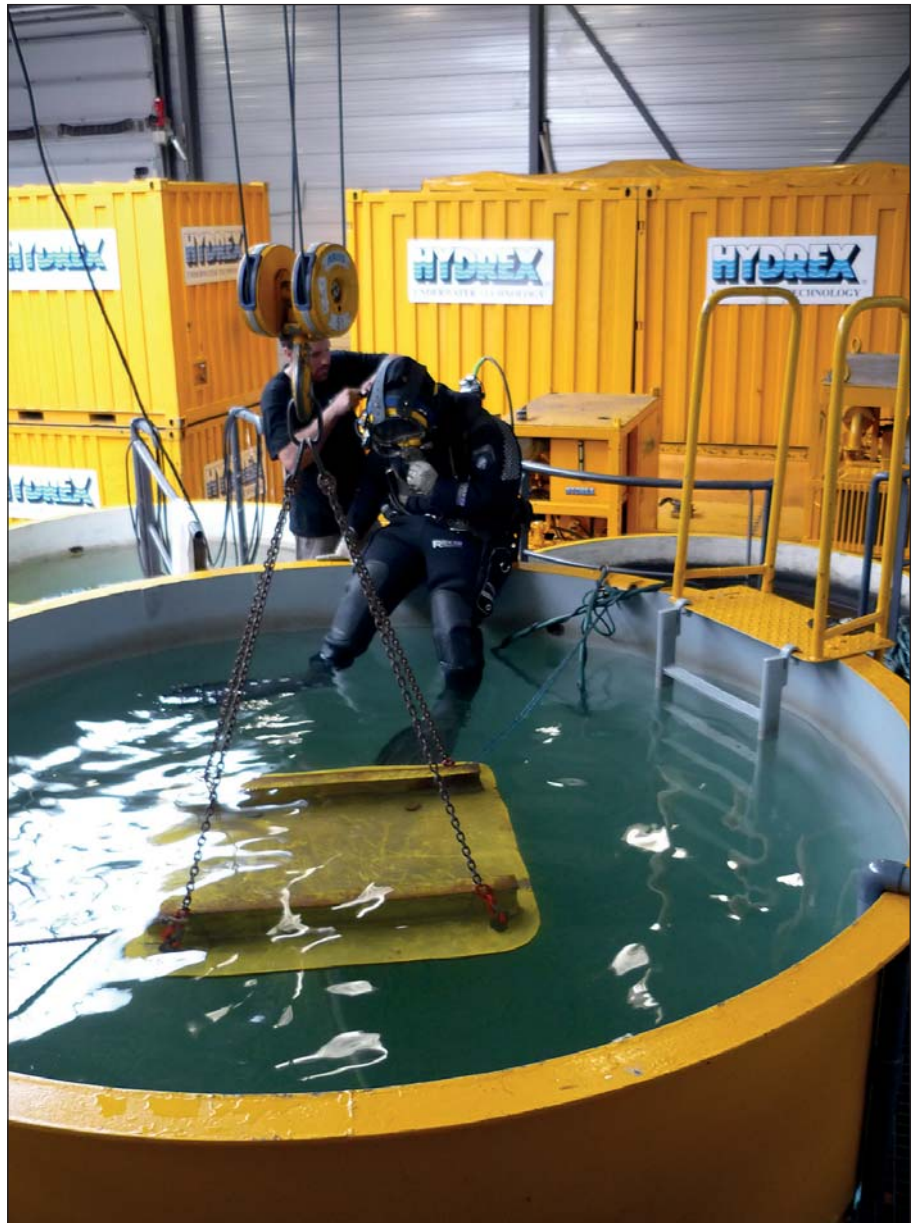
Hydrex diver/technicians can carry out inspections underwater and on-site very swiftly without disturbing the vessel's sailing schedule.

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.



Our diver/technicians are trained to perform all repair procedures.



Our training facilities include three dive training tanks to practice underwater welding and other repair work.



One of our supervisors monitoring an operation.

of the technical know-how and practical knowledge Hydrex has accumulated for over 40 years.

One of the aspects the training focusses on is learning to be flexible during an operation. Our teams have to be able to respond to changes if the need arises. This is very important because they are the ears and eyes of our technical department during an operation. From the initial inspection all the way through to the final check-up of the repair, they are

the ones underwater and on-site. It is vital that they can handle any kind of situation when their training is completed.

This means that if a shipowner needs assistance, we are able to send a team of certified diver/technicians to the vessel immediately without losing time. They can carry out both simple and complex jobs even in harsh circumstances. They do this uniformly without unnecessary loss of time, quality or safety.



Our fast-response centers are stocked for a quick mobilization to small and large operations.

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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Hydrex divers receive extensive training, both external and in-house.



Our divers can carry out any repair without unnecessary loss of time, quality or safety.

Putting the customer first

The customer pays to get the best results without losing any unnecessary time. So that is what we deliver. The scope of work is agreed upon in advance and the owner is given a precise assessment of the duration of the operation. Our many years of experience with a wide array of underwater repairs enables us to make an accurate estimation of the needed time frame.

Trying to lengthen the job is unbeneficial for the customer as well as for us because it is in direct opposition to what we are trying to establish: a relationship based on trust and good results. We give clear answers to any questions we receive and we deliver what we promise.

Over the years we have not only built long-lasting relationships with our customers, but also with classification societies, OEMs and local support bases around the world. Correct and direct communication is an essential factor in establishing and maintaining a network you can rely on. This allows us to quickly arrange spare parts, an engineer from the OEM or any external equipment needed for an operation.

Conclusion

We understand how important it is for a ship to keep her schedule. Going off-hire for days or even weeks to have underwater repairs carried out or pay an unscheduled visit to a drydock costs a tremendous amount of money. That is why we have developed technologies that allow us to perform underwater repairs within a very short time and

to drydock standards.

In the next article you can read about a recent emergency operation that illustrates this perfectly. ■

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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or at
+ 32 3 213 53 00

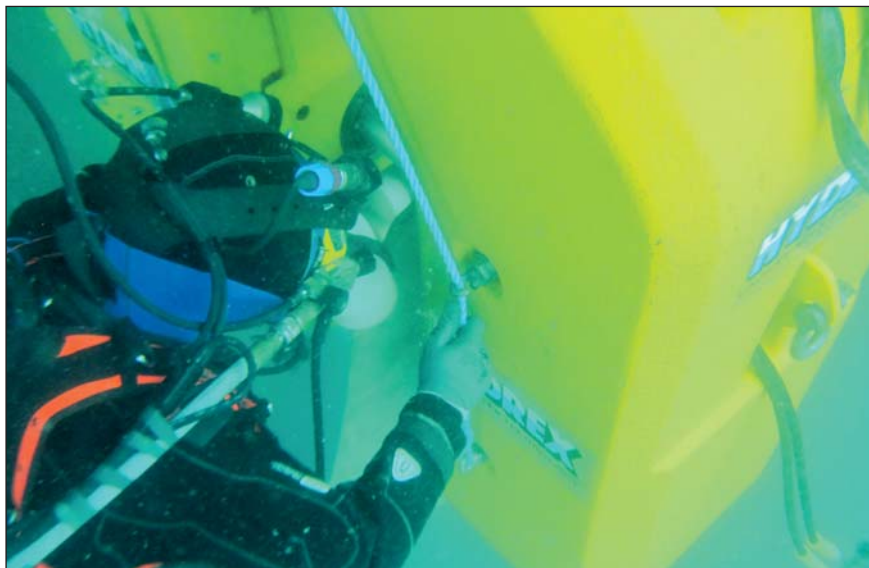
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Fast underwater propeller blade straightening

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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Join us at Nor-Shipping 2017

Hydrex will be present at Nor-Shipping in Oslo from May 30 to June 2. We would like to welcome you at booth C01-14g in hall C. We are part of the Holland Pavilion.

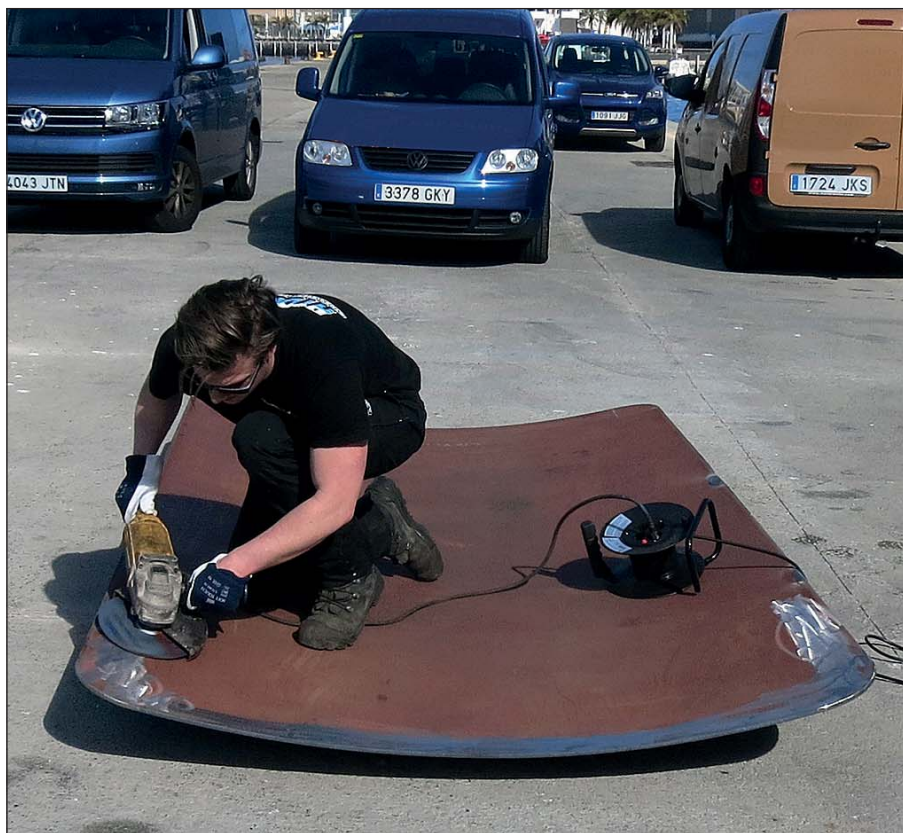
If you would like to learn more about how we can assist you, please visit us during the event. Our team will be happy to give you the information you need.



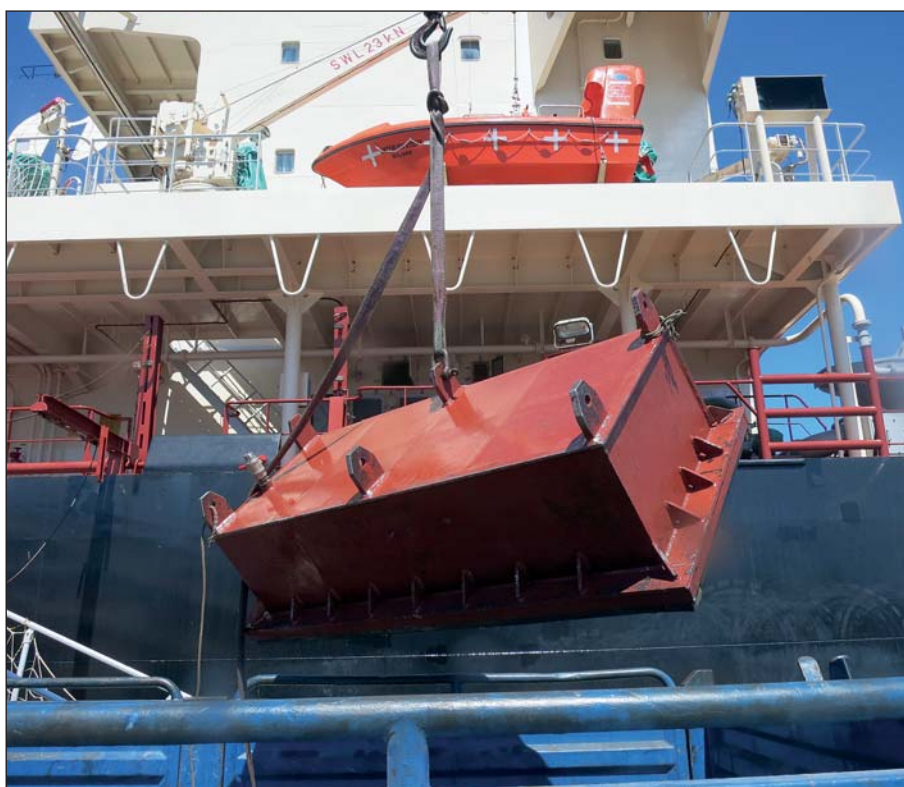
Fast intervention in Las Palmas ends ongoing delay

A fully loaded 180-meter bulk carrier suffered grounding damage in Las Palmas, Spain. An underwater repair was needed to allow the vessel to sail to her unloading destination safely. Unfortunately a first repair attempt proved unsuccessful. After the ship had been delayed for almost two weeks we were contacted to take over the operation and get the bulker sailing again as soon as possible.

Immediately after we put down the phone a small inspection team was flown to Las Palmas to perform a detailed underwater survey. This would give us a full assessment of the damage as well as all required measurements needed for the repair.



Preparing one of the doubler plates for installation.

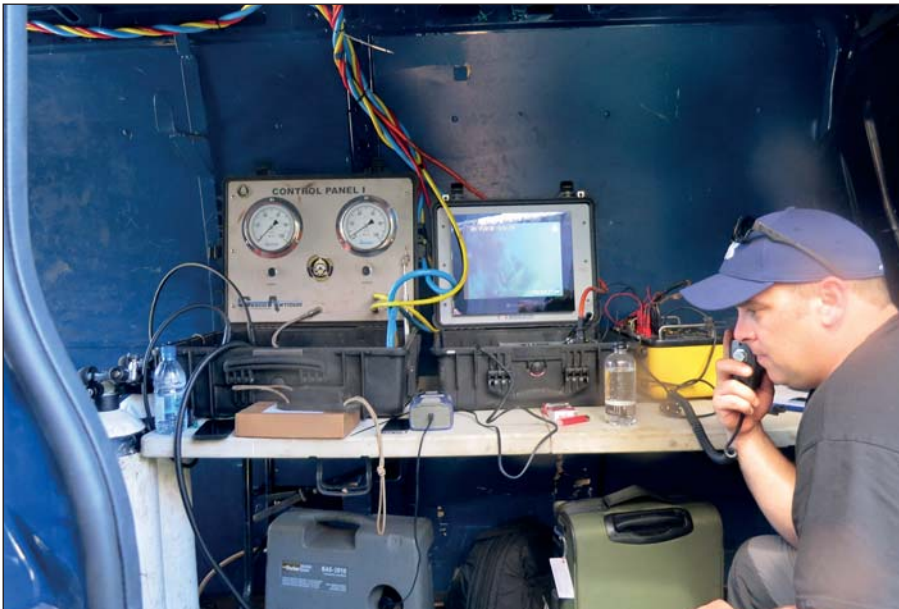


Removal of the cofferdam used prior to our involvement.

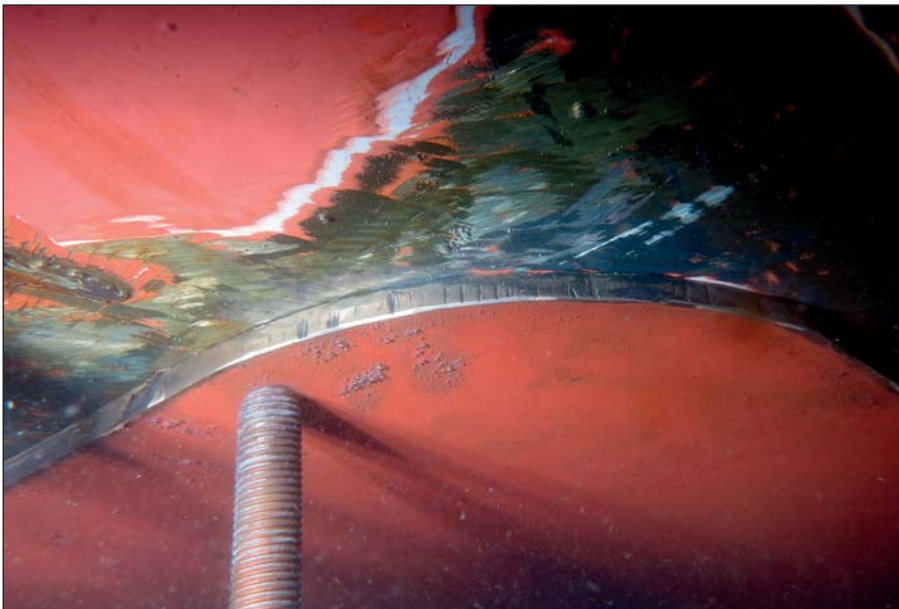
With the information from the inspection our technical department could very quickly propose a repair plan to the owner of the vessel.

Our many years of experience allowed us to take all factors into account that could influence the possible repair solutions. This included the location of the damage, the shape of the hull and the situation on the inside of vessel.

Because we have a longstanding relationship with the classification society, they knew we had all the certificates and had the skills for (emergency) underwater repairs. They informed the owner that the repair would be given the greenlight if Hydrex was involved. Needless



Hydrex team leader monitoring the operation.



One of the doubler plates secured over damaged area.



Hydrex diver/technician preparing the hull for installation of doubler plate.

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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Diver/technicians getting ready for underwater operation in Las Palmas.

to say the customer gladly accepted the proposed solution. A team of additional diver/technicians was mobilized straightaway. Just days after we were contacted our repair team was on-site and ready to salvage the operation.

Hull plating repair allows vessel to sail on

When the diver/technicians arrived in Las Palmas the inspection team had already arranged the needed

equipment and repair material. This was done in cooperation with our local support base.

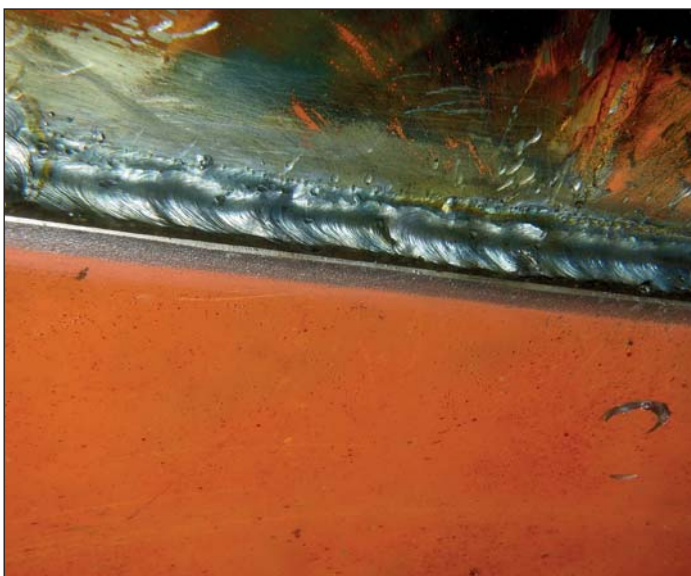
The first step of the operation consisted of removing the cofferdam that had been installed during the previous effort to repair the damage. Once this was done our diver/technicians could start the actual repair as proposed by our technical department. They installed two doubler plates over the affected areas of the flat bottom. After independent tests

had verified that the operation was successful the classification society gave its approval for the repair, as was expected.

The ship had been laying idle for almost two weeks while the first repair attempt was made. This delayed the delivery of the cargo. It cost everyone involved precious time, money and consequential loss of reputation.

The owner and port authorities were very satisfied that Hydrex was able to step in and resolve the issue so fast. Working in shifts, we made sure that the ship would suffer no additional delay. Just days after we were contacted, the grounding damage had been temporary repaired. This allowed the owner to sail on to the next destination to unload the cargo. He now has the possibility to take his ship to dry-dock at a location of his choice and arrange the visit at a convenient time. ■

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The repair allowed the owner to continue the ship's voyage and unload its cargo.

Swift on-site thruster maintenance and repairs



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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Keeping ships in business

Hydrex offers turnkey underwater repair solutions to ship-owners wherever and whenever they are needed. Hydrex's multi-disciplinary 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 Rotterdam, 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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