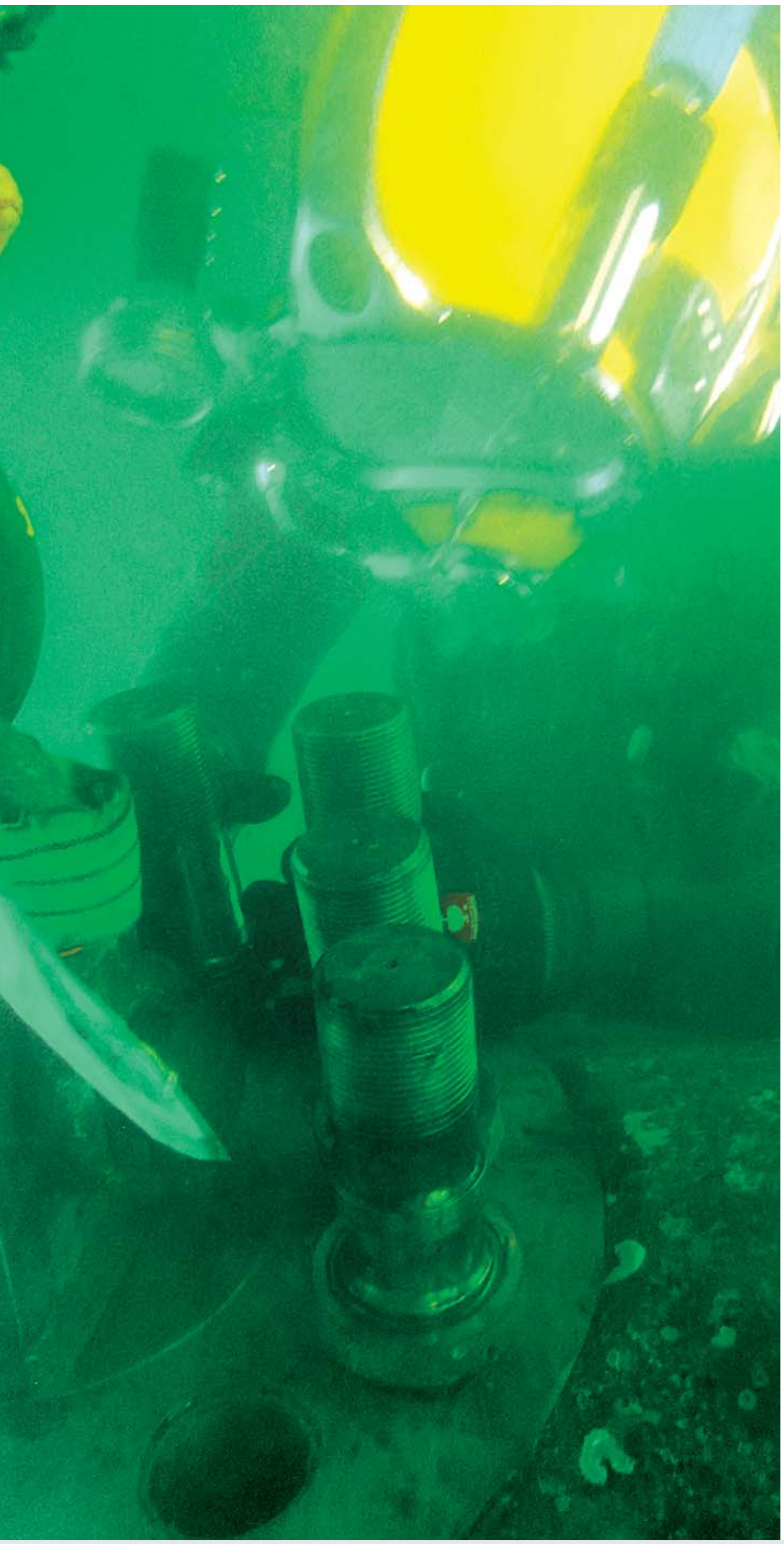
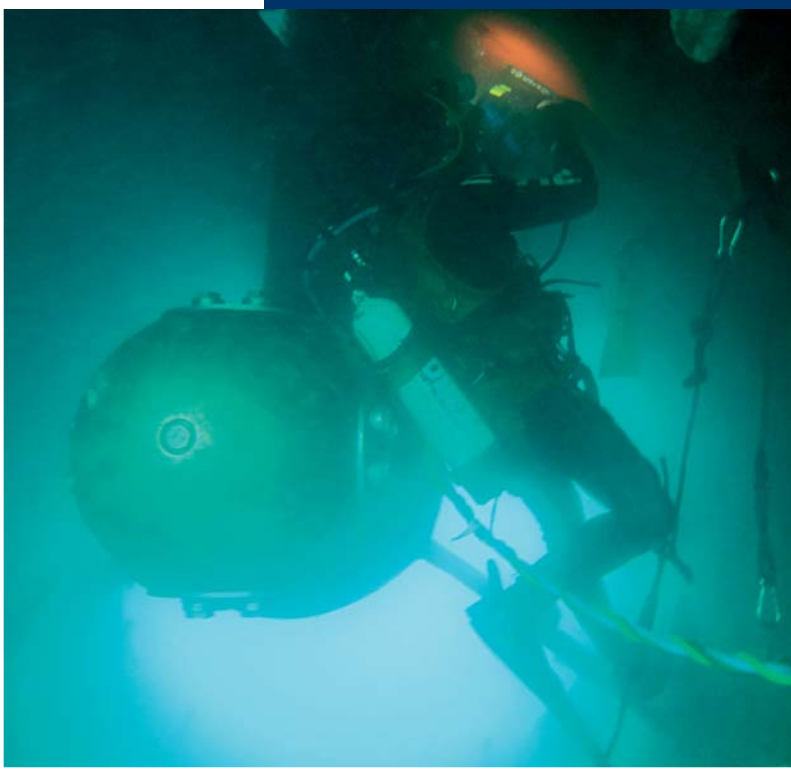
HYDREX®

UNDERWATER TECHNOLOGY

NEWS

LETTER | 272





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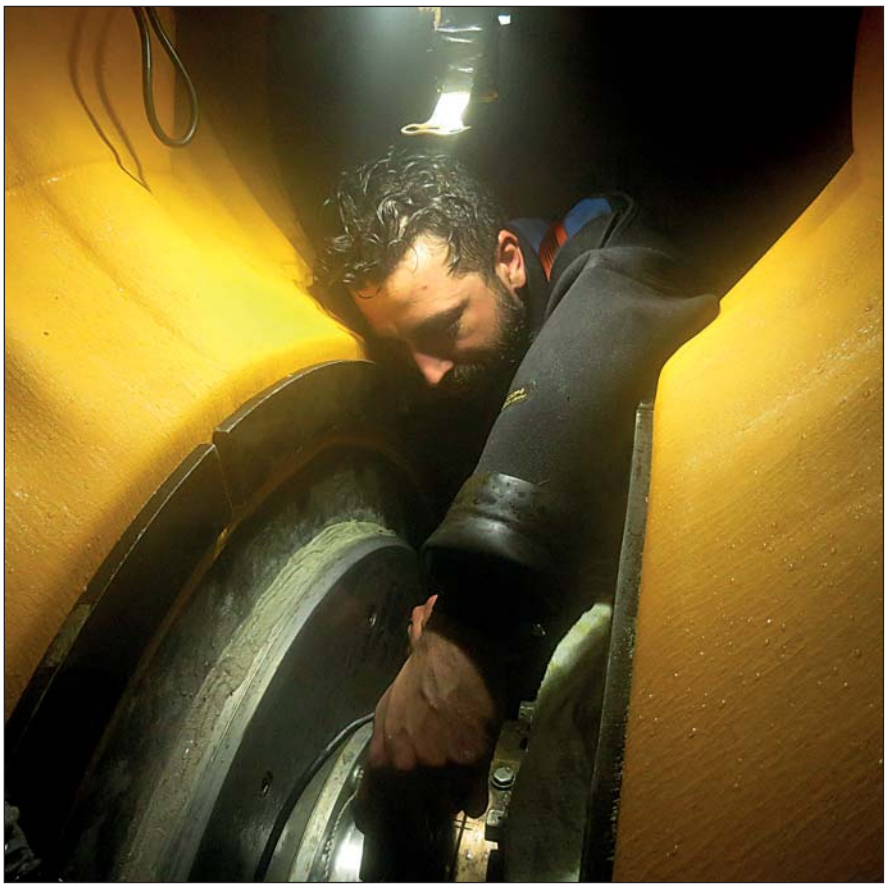
KEEPING SHIPS IN BUSINESS

ISO 9001 certified

Underwater services and technology approved by:

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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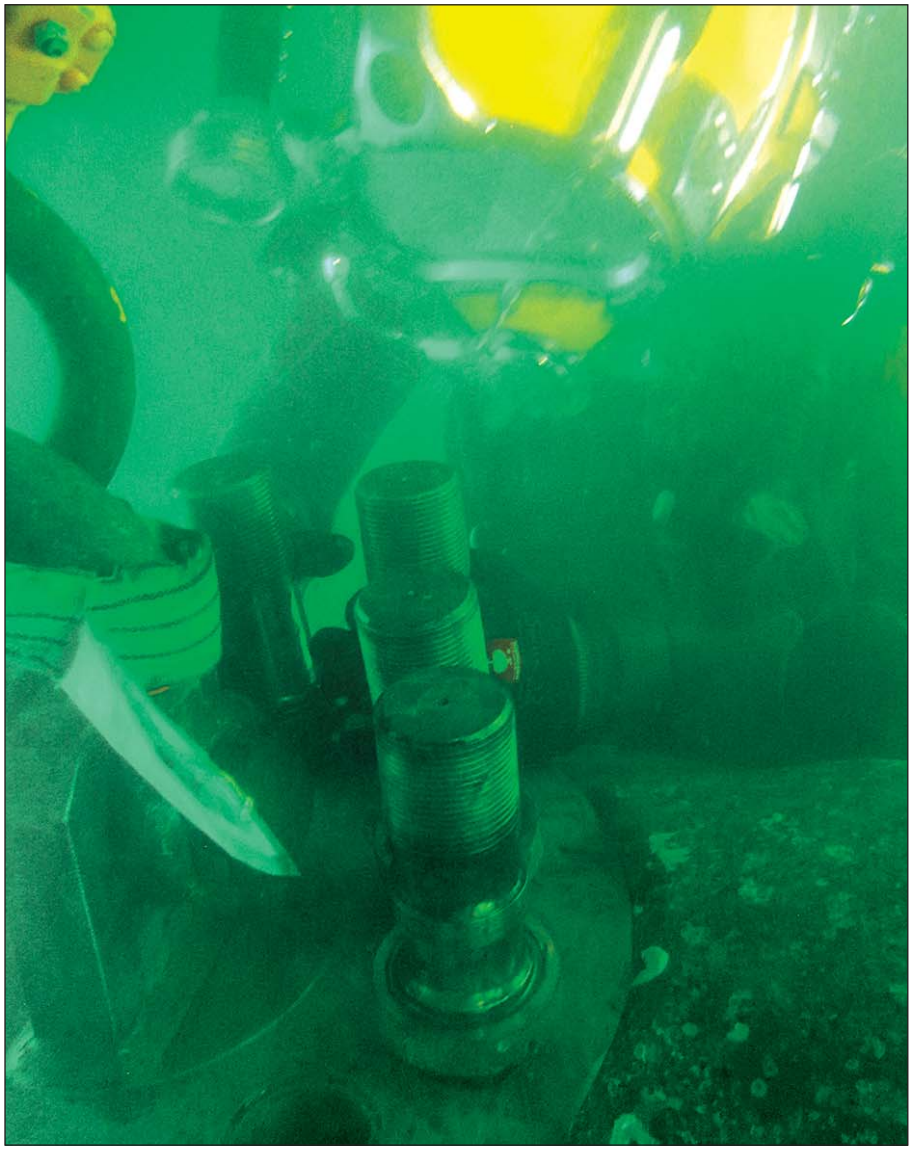
Underwater bow thruster repairs around the world

Our diver/technicians can perform a wide range of repair or maintenance work on bow thrusters. An entire unit can be overhauled, propeller blades and seals can be replaced or repair work on another specific part of a thruster can be performed on-site. These repairs are performed in cooperation with all OEMs and can be carried out while the ship stays afloat with minimum impact on its schedule.



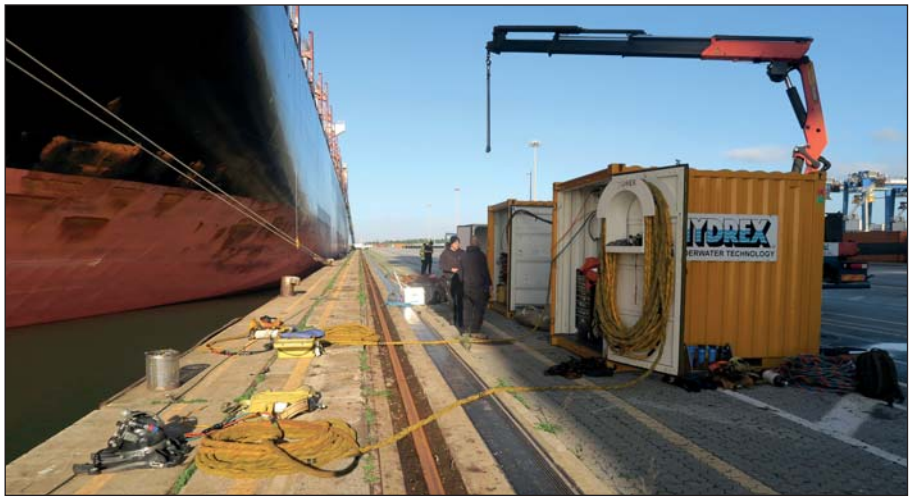
Bow thruster being prepared for removal in Italy.

Underwater reinstallation avoids delay for container vessel

A month after we removed the bow thruster of a 300-meter container ship our men once again mobilized to Italy. They reinstalled the overhauled unit underwater with the use of our flexible mobdock technique.

The available time window for the removal of the bow thruster had been very short because of the tight schedule of the vessel. For this reason the job was split in parts, performed in different ports.

The time frame for the reinstallation was slightly larger, allowing our team to carry out the job during a single stop of the vessel. The divers used our flexible mobdocks to close off the thruster tunnel once the over-



Hydrex truck and equipment next to container vessel in Italy.

Thruster unit being lowered into the water.

Installing one of the blade bolts.

hauled bow thruster had been brought into the tunnel.

All water was removed from the tunnel. This created drydock-like conditions for our divers while the vessel stayed afloat. The team then secured the unit and connected it. Once this was done the thruster propeller blades were installed one by one. With these in position the ship was ready to sail.

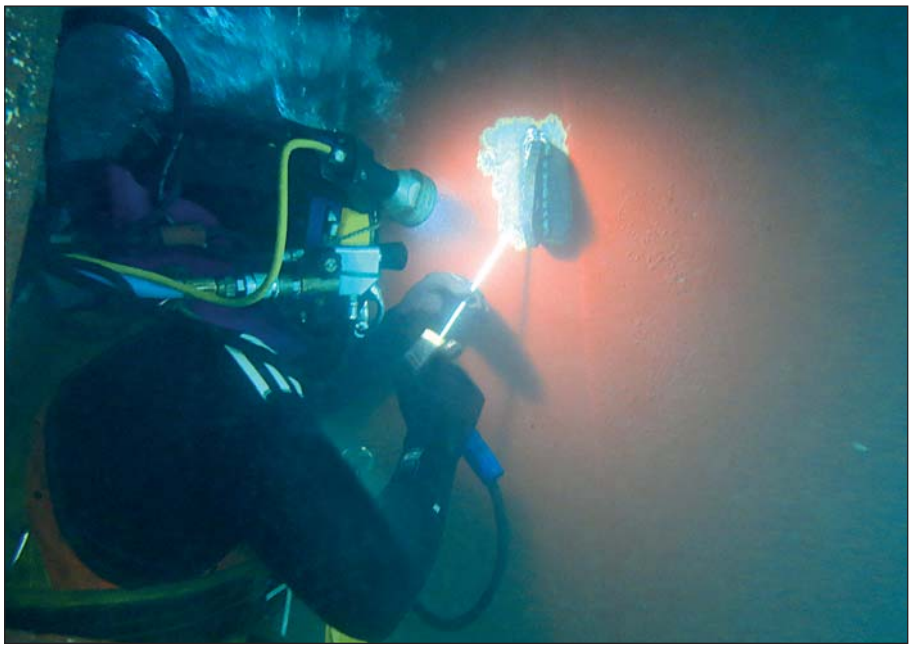
Our men worked in shifts around the clock to finish all tasks as fast as possible. As a result the charterer did not have to worry about his vessel's schedule.

Replacement in stages keeps cruise ship on schedule

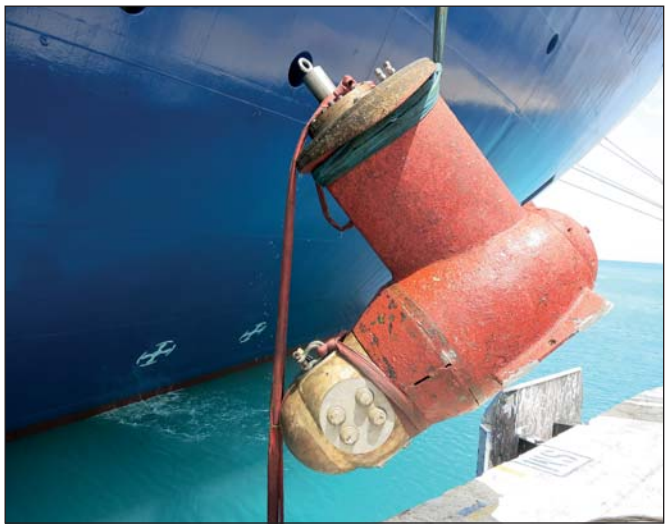
A 208-meter cruise vessel sailing in the Caribbean suffered steering problems after one of its two bow thrusters malfunctioned. Having to depend on assistance every time the ship berthed would quickly become very expensive. Going off-schedule, however, to have the bow thruster replaced would cost the owner both in finance and reputation.

A solution was therefore needed that could be carried out on-site without interrupting the vessel's schedule. Enter our tried and tested flexible mobdock technique and our experienced diver/technicians.

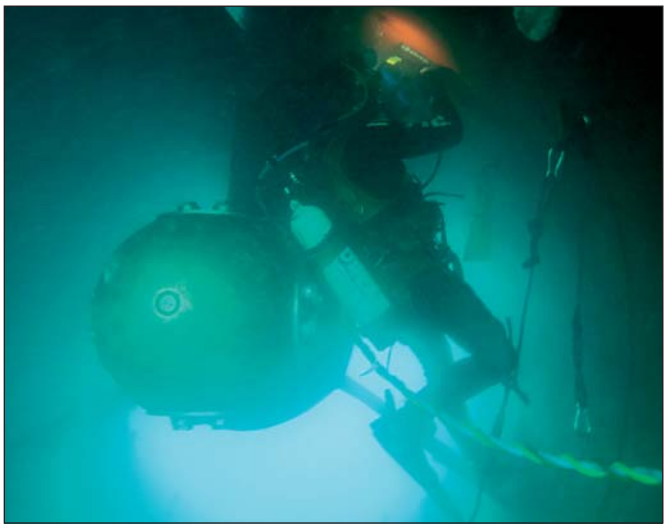
There was only a time frame of eight hours at each port of call during the ship's cruise in the Caribbean. It was therefore important that the operation was split up in parts that could be finished before the vessel had to leave again. A perfect planning and constant communication between our technical department in the office and our team on location was essential in achieving this.



Hydrex diver preparing the thruster tunnel for removal of the unit in the Caribbean.



Old thruster unit brought to shore.



Diver inside the thruster tunnel during bow thruster operation.

Preparing the new unit for installation.

Underwater bow thruster operation on Ferry in Oslo

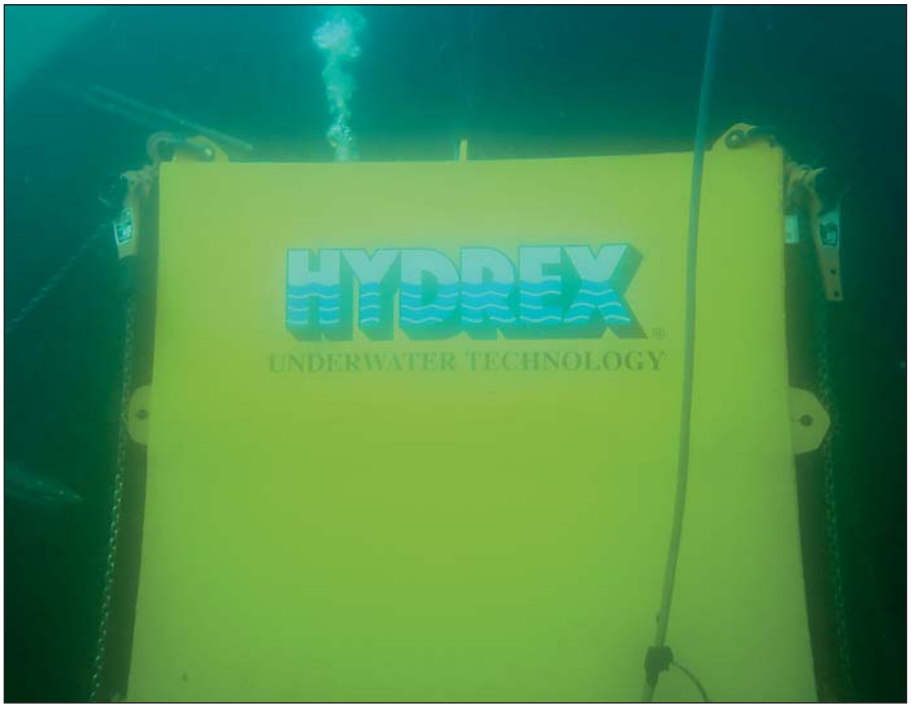
Recently a team of our diver/technicians mobilized to Oslo, Norway for an underwater bow thruster operation on a large ferry. A seal in the gearbox was leaking and needed to be replaced. A small window was made available for the operation, but the repair had to be finished before the ferry needed to depart with its passengers.

Our technical department proposed to replace the defective seal underwater with a tailor-made cofferdam. The cofferdam was designed by our R&D department and fabricated at the Hydrex headquarters in Antwerp. This allowed the divers to remove the damaged seal ring and replace it with a new one in a dry environment.

Flexibility is an important element of every job Hydrex carries out, but in this case it was crucial that the repair was finished before the ferry needed to depart with its passengers.

Hydrex equipment arriving at ferry berth early in the morning.

Tailor-made cofferdam lowered into the water in Oslo.



Cofferdam installed over gearbox of the bow thruster.

By creating a dry environment underwater we can work in drydock like conditions.

Information

If you have any questions regarding a possible bow thruster repair, do not hesitate to contact us.

An animation of the procedure used can be found on our website. For more information on thruster or other underwater repairs, please contact one of our offices. We are at your disposal 24/7 and ready to mobilize almost immediately.

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Bow thruster operations are carried out using our flexible mobdocks that close off the thruster tunnel on both sides. These lightweight mobdocks can quickly be transported to any location around the world.

In most cases a thruster overhaul is planned during a scheduled drydocking. This usually means that the unit is removed in drydock. The ship then has to wait for the repaired thruster to return and be reinstalled before the vessel can leave drydock. This means a longer drydock time and consequent cost. We can however remove the unit while the ship is still afloat so it can already be brought to the manufacturer to be overhauled. When the vessel enters drydock the overhauled unit will be ready for reinstallation without any delay.

The reverse procedure is also possible. If the thruster is removed in drydock, we can reinstall it in dry conditions underwater at a later date. In this way the ship can already leave drydock while the unit is still being repaired. ■

500-ton, 70-meter long, 18-meter high drydock door repair in Cadiz

This year marks the 45th anniversary of Hydrex. We will be looking back at some of the many key operations our teams performed since the company was founded in 1974. We will do this by republishing an article from the vault of the Hydrex Magazine each month.

This month we have some very interesting and extensive work for you to have a look through. It represented another first for Hydrex engineering and the field of underwater repairs. In 2005 we took on the replacement of eight one-ton hinges of a 500-ton drydock gate. Instead of removing it to shore, as had always been done in the past when repairs of this kind were needed, we did all repairs on-site. This prevented any damage to the gate while also allowing other repair work to be done at the same time because the drydock itself remained dry.

This project was done with IZAR (now Navantia), at that time Spain's leading state-owned shipbuilding firm and Europe's second largest shipbuilding company.

This was a major project that lasted two months – all meticulously planned in advance. We kept to the time schedule regardless of some unexpected bad weather and delivered a fully repaired gate to the owners so that their drydock would continue to be operational. ■

This article was first published in August 2005.

Major work done to render drydock operational

Hydrex completed a major project repairing a drydock gate at the IZAR shipyard in Cadiz, Spain. This was an especially interesting project because normally this job would have required removing the 30-year-old gate from the drydock, taking it out of the water and transporting it to shore. Then some of the work would have been carried out on shore while the most important part of the job would still have to be done underwater on the foundations of the gate.

We took a very different approach to the whole concept of these repairs. The work activities were arranged so

Diver in prepration to work on the drydock gate.

Work pontoon before IZAR drydock gate.

Some of the new hinges that were put in place under the drydock gate.

Examples of ones that were removed.

that the drydock could remain in operation for most of the repair rather than be flooded with water and completely out of use. The owners decided to use this repair time for the maintenance of the drydock itself.

Our team carried out the project on-site using advanced underwater techniques: supporting the gate on hydraulic jacks and replacing all 8 hinges while the gate remained in place. The other major benefit to this method was that the potential damage to the 30-year old gate during the transportation was avoided completely. This was important because the pressure exerted on a door of that age could have very easily resulted in extensive damage.

To give an idea of the scope of the project, the gate weighs 500 tons, is 70 meters long and 18 meters high. Each of the hinges weighed over a ton.

The operation required us to be on-

Lowering a new gate hinge into the sea.

site for approximately 2 months. A 60-day schedule was worked out for the repairs and the work was done within that time, despite the bad weather conditions at the start of the operation.

The preparations for the project were quite extensive. First the sea-bed in front of the gate hinges had to be dredged and all the accumulated debris and silt had to be removed. To do this a couple of dredging pontoons were established before the lock gate. With the use of divers, mobile cranes and hydraulic pumps all the excess material was then removed.

This gave enough room and visibility for the diving team to go down to the hinges and start the disengagement procedures to disconnect the hinges from the gate. What had actually happened over time was that the gate had sunk 60mm due to wear of the hinges and axle. The teams were then able to go into the work area, jack the door up to its original level and remove the old hinges.

After all eight hinges were removed and brought to the surface our men spent hundreds of hours underwater gouging, cleaning, welding and preparing the positions for the new hinges. A new axle was put in place

Dredging work that was necessary at the start of the project.

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 mobile crane within the drydock.

The drydock seen from the inside during the operation.

at the bottom of the gate. Through a detailed and complicated procedure (worked out carefully in advance) new hinges were then swiveled and rotated into place, with only millimeters to spare. These were positioned on the concrete foundations beneath the gate.

The divers had to work with very low space clearances. They had a work space of just one meter for this maneuver. As each hinge was correctly positioned, it was secured using special chemical anchors.

The technical detail of the above was of course extensive and far more complex than this simple description portrays. Even though this work required highly skilled underwater professionals it saved an enormous amount of time and expense. We were able to deliver a highly professional and operational drydock to its owners at far less cost and much more quickly than with any other method. ■

Underwater scrubber sea chest installation

Our wide range of maintenance and repair services includes the installation of additional sea chests required for the intakes and outlets of scrubber systems. These afloat installations are performed by installing a cofferdam on the hull.

We can help you when going to drydock is not an option, if the scrubber equipment is not available yet during docking or if the scrubber system needs to be installed before the next scheduled docking. We are able to carry out the installation of sea chests while your vessel stays afloat and in most cases during cargo operations.

If you would like to discuss this possibility of in-water scrubber system installation, please contact us at +32 3 213 53 00 or hydrex@hydrex.be

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Always on time

Hydrex offers turnkey underwater repair solutions to shipowners wherever and whenever they are needed. Hydrex's multidisciplinary 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 performs 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 we 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.

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