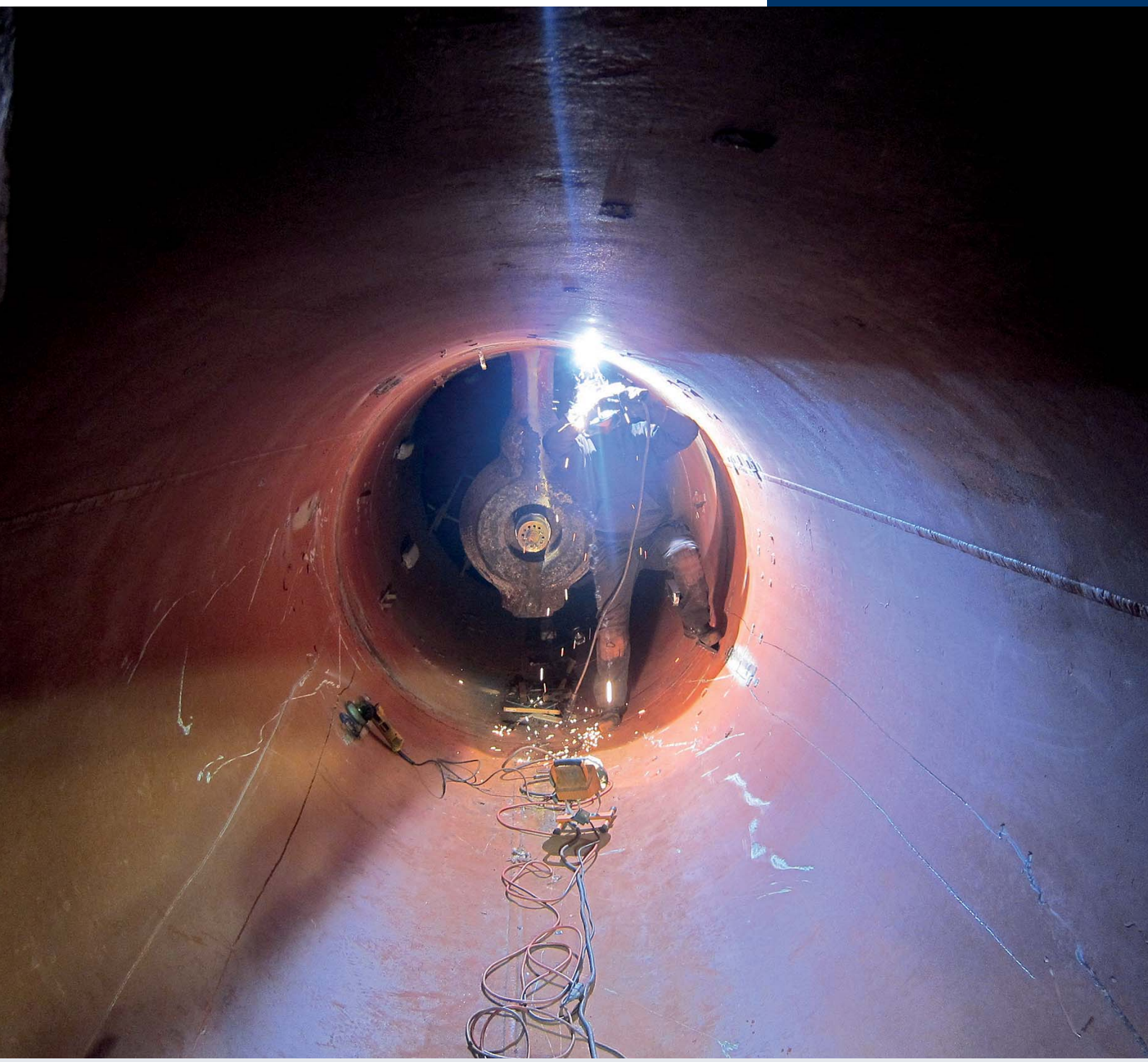
HYDREX®

UNDERWATER TECHNOLOGY

NEWS

LETTER | 210



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KEEPING SHIPS IN BUSINESS

ISO 9001 certified

Underwater services and technology approved by:

Reduce your fuel bill by 10% now without going to drydock

There are two simple, easy and inexpensive steps that together can save you 10% of your fuel costs.

Propeller buffing is a new technique developed and delivered by Hydrex to keep your propeller in optimum condition. This is not conventional propeller polishing. Routine propeller buffing can save you 5% of your fuel bill, is very easy to schedule and carry out regularly, starting just as soon as you want to save 5% of your ship or fleet's propulsive fuel costs. This offers extraordinary Return on Investment (ROI) in terms of instant fuel savings. Very low outlay for very high returns and an extremely rapid payback.

Propeller boss cap fins (PBCF) can be installed by Hydrex divers anywhere, any time. This device is custom made for your ship's propeller. It can save an additional 5% of your fuel costs. There is a lead time of a couple of months for the PBCF to be made for your ship but Hydrex can install your new PBCF as soon as it's ready and you can start saving an additional 5% of your fuel bill immediately.

HYDREX PROPELLER BUFFING + PBCFs = 10% PROPULSIVE FUEL SAVINGS

Contact one of our offices today for more information and a quotation.

HYDREX®
UNDERWATER TECHNOLOGY

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On-site bow thruster removal and reinstallation in New York

To save time and money for the owner of a 190-meter, 28,747 GRT bulk carrier, Hydrex removed the bow thruster of the ship and installed a new unit during the vessel's stop in New York. By carrying out both parts of the operation while the ship was berthed, she could continue her schedule without going to dry-dock.

The Hydrex technical department prepared every step of the operation in detail to make sure that the team could carry out both the removal of the old bow thruster unit and the installation of the new unit during a single operation, in the shortest possible time and without any loss of quality.

Together with all the necessary equipment, a team mobilized from the Hydrex office in Tampa, Florida, to the vessel's location. Because the vessel was trimmed to a position that brought the thruster tunnel out of the water, there was no need to close off the thruster tunnel.

The team set up a monitoring station on a crane barge which was then maneuvered next to the ship. While part of the team removed the port-side grid to get access to the thruster tunnel, the other diver/technicians went on board and prepared the engine room for the removal of the unit.

An inspection of the old bow thruster unit revealed that a mooring rope had gotten tangled around the propeller hub, causing the malfunction that led to the need for replacement. The divers removed the hub first. Next the team cut the support brackets connecting the gearbox to the thruster tunnel and secured the unit with chains. It could then be fully disconnected from the thruster room and was carefully lowered, extracted from the tunnel and brought to the surface.

The thruster tunnel prior to removal of the portside grid.

Propeller hub of the old unit, damaged by a mooring rope.

The new bow thruster unit was then lowered into the water and brought into the thruster tunnel.

Next our diver/technicians positioned the gearbox using chain blocks and

Hydrex underwater 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 much time and money.

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 for a wide range of actions.

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.

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The old bow thruster unit.

Preparing the thruster tunnel for removal of the old unit.

secured it with bolts. The team completed the operation by reconnecting the thruster unit to the engine room and reinstalling the portside grid.

To keep the delay for the customer to the absolute minimum, diver/technicians worked in shifts around the clock. By performing both the removal and reinstallation of the bow thruster unit underwater the vessel did not have to drydock, saving the owner valuable time and money.

Performing both the removal and reinstallation on such a tight schedule takes a lot of planning. This can only be done successfully by people who have familiarity with such challenges and the relevant know-how. This is why Hydrex has a technical department capable of executing all the required planning as

New bow thruster unit ready for installation.

Removal of the old unit from the thruster tunnel.

Bringing the new unit inside the tunnel.

New unit installed and secured.

well as the engineering aspect of an operation and diver/technicians who are trained and qualified to perform the full range of required class-approved repair procedures in even the harshest conditions. An effective, competent team is the only way to consistently achieve a high quality result in the short periods of time usually available to ships ■

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KEEPING SHIPS IN BUSINESS

Hydrex, 40 years of paving the

2012
Hydrex's Subsea Industries wins National Energy Globe Award for Sustainability for Ecospeed, non-toxic hull coating system

First full underwater section (5 meter x 5 meter x 2 meter) inserted and wet welded in a ship hull

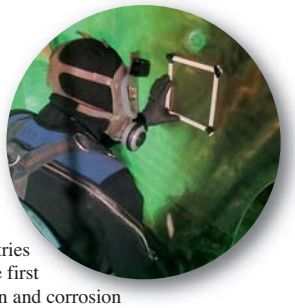
Surface Treated Composites White Book by Boud Van Rompay, the textbook of non-toxic hard coatings, published

2014
Hydrex's Subsea Industries wins Seatrade 2014 Innovation in Ship Operations award for Ecoshield®

Hydrex develops propeller buffing as a means of cleaning and restoring propellers to mirror-like finish

Hydrex delivers underwater propeller boss cap fins (PBCF) installation for improving fuel efficiency of propellers

2013
Hydrex develops propeller habitat to enable any needed underwater propeller inspection and repair to be carried out "in the dry"



Hydrex's Subsea Industries releases Ecoshield®, the first fully effective cavitation and corrosion protection for rudders and underwater running gear

ECOSHIELD®
THE DIAMOND STANDARD IN STEEL PROTECTION

1984
Triple head Typhoon hull cleaning unit

First underwater propeller cutting and modification jobs carried out with in-house developed tools and equipment

1985

1990

1983
First insert repair in double bottom tank

First propeller polishing machines developed

New office and first fast response center opened

1983
Subsea Cleaning Systems founded, later to become Subsea Industries, the Hydrex company that specializes in hull and running gear protection and fouling control

SUBSEA INDUSTRIES

1991
Introduction of large habitat system for civil repairs

1974
Hydrex founded in Antwerp, Belgium, by Boud Van Rompay

HYD
UNDERWATER

1981
Development of first hull cleaning machine

1977
First wet welded rudder repairs

1980

1975

1979
First permanent underwater repair with prefabricated cofferdam - m/v *Lunar Venture*

1978
First large underwater wet welded bulbous bow repair

1976
First large wet welded repairs on ship hulls

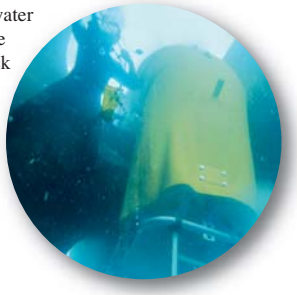
1974
Pioneered underwater hull cleaning in Europe

e way in underwater technology

2008
ROV hull cleaning and inspection system developed

Hydrex LLC in Tampa Bay opened

2006
First dry underwater seal repair inside flexible mobdock



2002
First dry underwater thruster operations with flexible sheets

Propeller cold-straightening machine introduced

010

2005

2009
Hydrex Spain opened in Algeciras, Spain

Hydrex develops the rudder mobdock technology for permanent underwater rudder repairs

Hydrex wins Lloyd's List Ship Repair and Conversion Award at Lloyd's List 2009 Global Awards

2002
Lloyd's List SMM Award for Innovation in Naval Shipbuilding and Marine Technology

Commercial launch of Ecospeed®

1993
Research begun on developing a new, long-lasting, non-toxic method of protecting ship hulls and running gear and keeping the hull ultra smooth, the Ecospeed® concept

ECOSPEED®
SHIP HULL PERFORMANCE TECHNOLOGY

2000

2001
Hydrex opens new fast response center in Antwerp with state-of-the-art logistics, tools and diving support equipment

1995

1992
Class approvals for permanent crack repairs

1996
First use of large steel cofferdams for thruster change-out and repair

Hydrex divers replace face seal underwater on ro/ro vessel

1999
25 years of service and experience

REX®
TECHNOLOGY

1998
High performance propeller polishing system developed

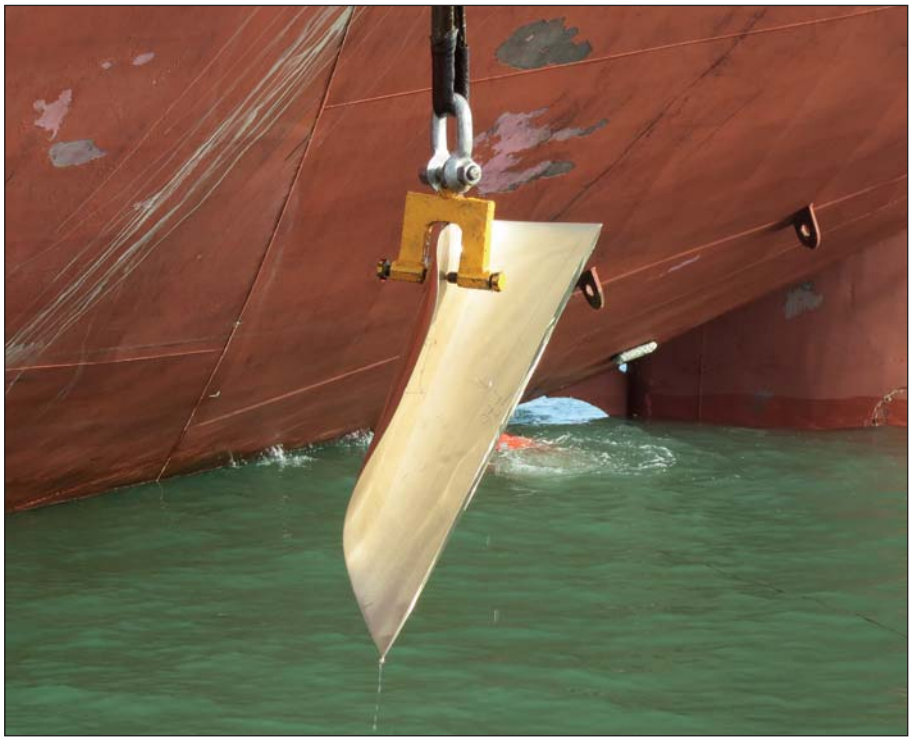
First ultra large insert repairs carried out on offshore vessels

1970

New generation propeller repair equipment used in La Brea, Trinidad and Tobago

Last month a team of Hydrex diver/technicians performed a blade modification on the propeller of a 190-meter bulk carrier in La Brea, Trinidad and Tobago. All five blades of propeller were severely bent and cropping was the only option.

Hydrex has developed a wide range of procedures to repair all types of propeller damage underwater. If possible the in-house developed cold straightening technique is used. This enables Hydrex to straighten damaged blades in-water, allowing commercial operations to continue without the need to drydock.



One of the cropped pieced brought to the surface.

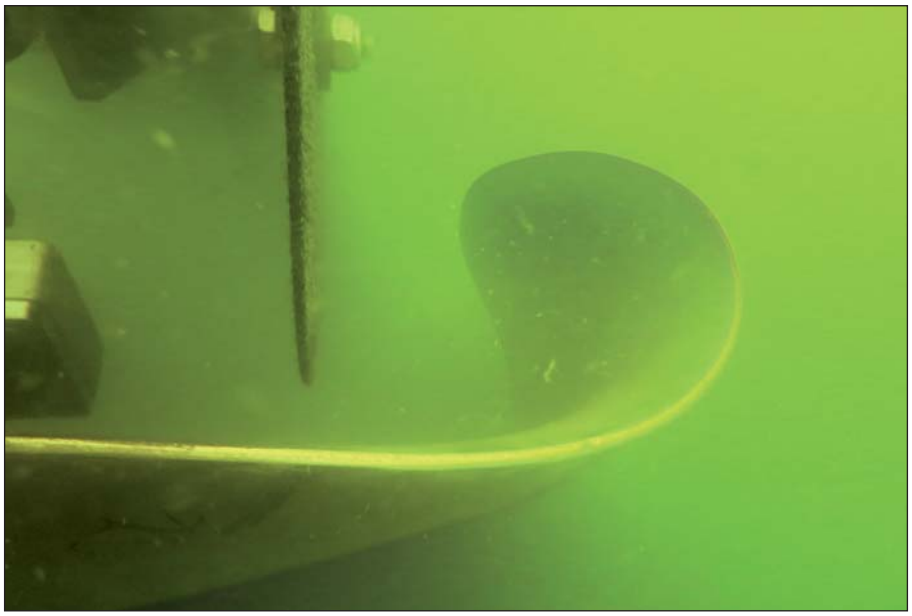
The bent blades were cropped one by one underwater.

In the following example, however, cropping was the only option as the damage to the propeller blades was too great to allow cold straightening. This kind of repair is carried out with the propeller blade cutting equipment developed by the Hydrex research department. By doing so, the best possible efficiency is obtained.

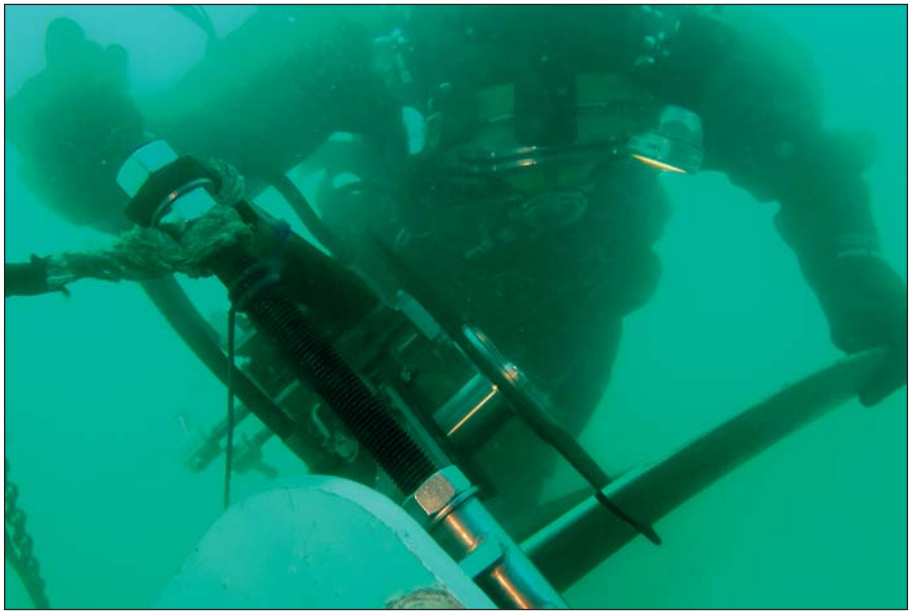
The blades of a bulk carrier's propeller were severely bent. A fast, on-site solution was needed to restore the propeller's balance and efficiency. A team was therefore rapidly mobilized to the ship's location in La Brea to restore the damaged blades to as close to their original condition as possible.

After the equipment arrived at the

Hydrex diver/technician preparing for underwater operation.



By performing the cropping on-site and underwater, a costly drydocking was prevented.



Hydrex diver/technician cropping a damaged propeller blade underwater.

vessel's location the team started the underwater operation with a detailed survey of the affected propeller blades. The inspection revealed that all five blades were bent over angles of up 90 degrees. Additionally, one of the blades had suffered small cracks on its leading edge. The team used the information acquired during the inspection to calculate and determine the correct measurements needed to modify the trailing edges of the propeller blades.

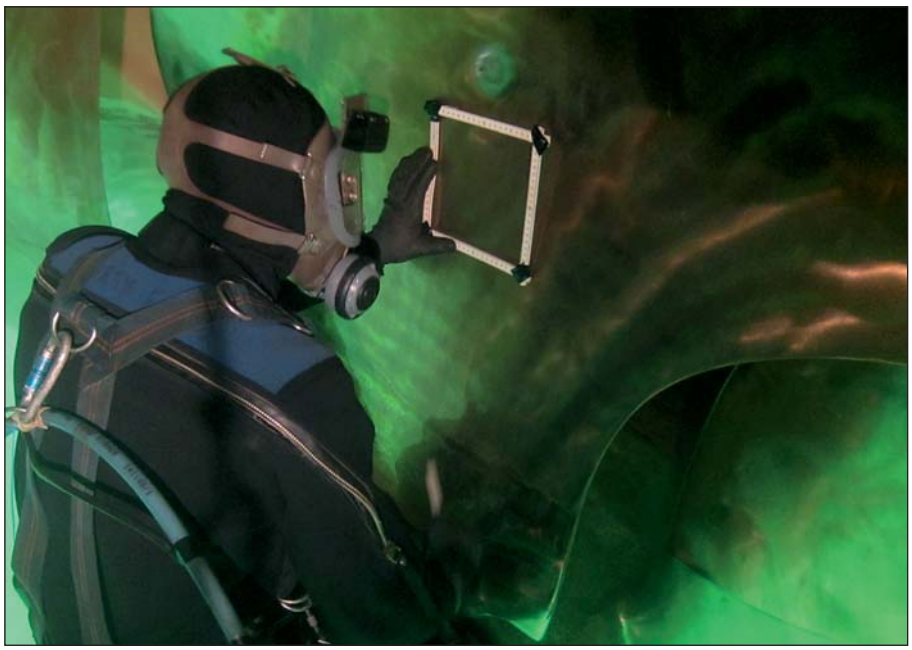
Next the divers cropped the blades and ground their edges to give them the correct radius. When the cropping was complete, the Hydrex technicians ground the cracked edge of the last blade and polished all blades to make sure that any remaining loss of efficiency would be minimal.

Conclusion

The operation returned the balance and the efficiency of the propeller. By carrying out the cropping on-site and underwater, Hydrex avoided a costly and time consuming drydock visit for the owner of the vessel. The bulk carrier could continue her schedule without going off-hire and with the performance of her propellers restored. ■

Hydrex custom solutions

There is a little-known service Hydrex offers shipowners, ship operators, technical departments, ship superintendents and others who have a need for underwater repair and maintenance: custom solutions to vexing problems. The only trouble is that people often don't come to us for these solutions because it never occurred to them that an out of drydock solution was possible.



Hydrex designed a technique that allows work on a propeller to be carried out underwater, but in dry conditions.

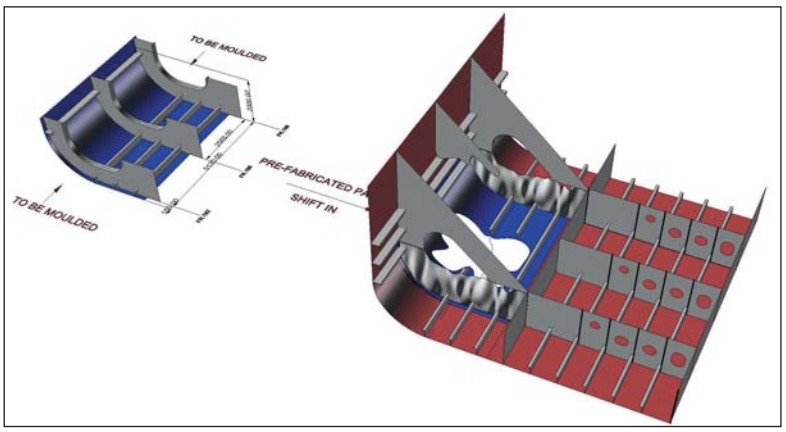
Hydrex offers custom solutions which require know-how, experience, engineering skill, R & D and a certainty of what can and what cannot be done with or to a ship out of drydock. Think of Hydrex as an underwater technology company, not a diving company. Although we certainly know how to dive! We also do customized solutions for ships and underwater structures.

Here are some examples:

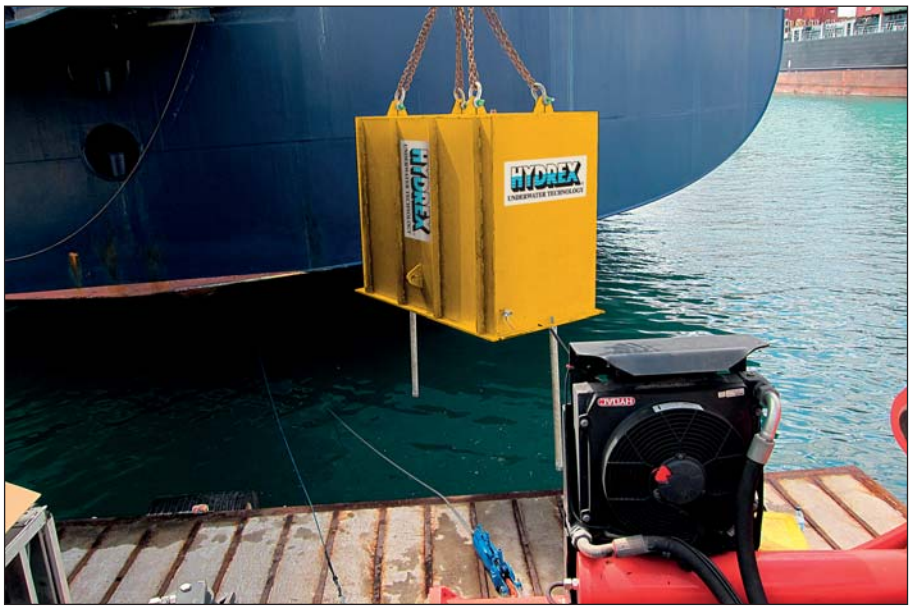
- One OEM delivered some ships with the wrong spinner cone bolts. These then had to be replaced under warranty but this could only be done in a dry environment. Drydock right? Wrong. Hydrex developed a cofferdam based solution which made it possible to replace the cone bolts without the huge extra expense and hassle of drydocking the ships. Once developed for one ship, the same system could be used on others which had the same problem.

- A ship builder delivered a new vessel to a navy but found during an inspection that there was a possible problem with the propeller blades. The ship was under warranty. The manufacturer needed to do a dry inspection, preferably without going to drydock. Hydrex designed and engineered a dry underwater repair technique which permitted the inspection to be done.

- A ship was grounded with major damage which made it look like it would have to go into drydock locally in the Persian Gulf.



A custom solution was designed in cooperation with naval architects to perform the replacement of an entire section of an underwater hull.



A special cofferdam was constructed to replace spinner cone bolts without going to drydock.

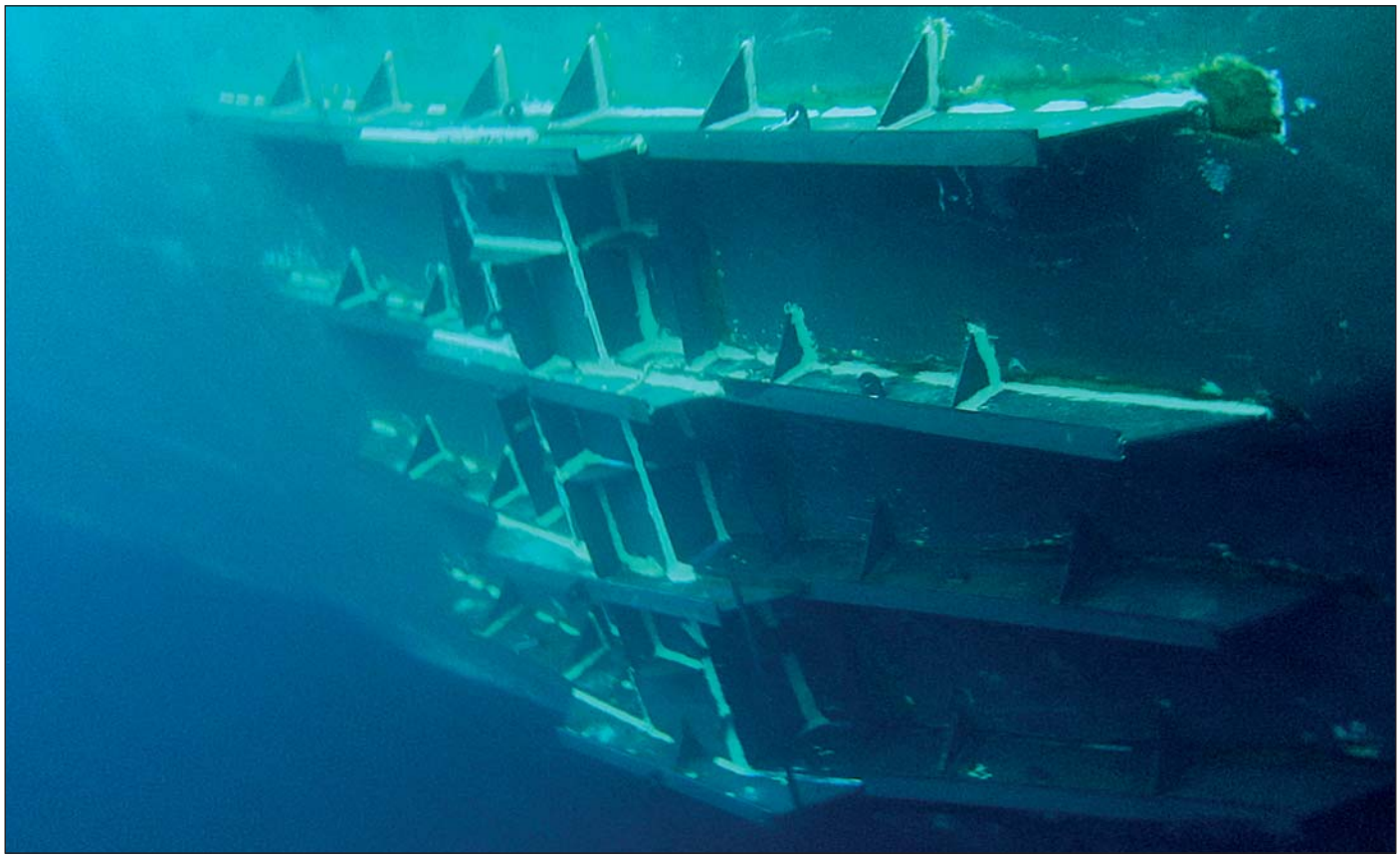
Hydrex worked with naval architects and in-house engineering to come up with a solution which would repair the damage and provide enough strength for the ship to sail on to its Chinese destination where it was due to drydock. This was done and saved enormous expense and delay.

There are many, many more examples. In some cases a problem with a specific vessel, once solved, opens the door to remedying the situation in a whole fleet or at least a number of vessels. In all cases the solution found requires knowledgeable engineering and advanced underwater technology and techniques which only a very few companies can deliver. Hydrex is at the fore-front of such solutions.

So, where is this leading? If you have a problem with a ship or a fleet, or any underwater structure for that matter, which you are not sure can be solved out of drydock, give us a call. We will evaluate the problem and let you know whether an underwater solution is feasible and, if it is, how much it would cost and how rapidly it can be carried out.

You'd be amazed at what can be solved without the need for drydocking.

If you have any problem with your ship or fleet that you feel might be resolved with a custom solution without drydocking, our Technical Department would be happy to discuss it with you and let you know if we can help with it. ■


Even for very severe grounding damage Hydrex can create a tailor-made solution for you.

Keeping ships in business

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 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 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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