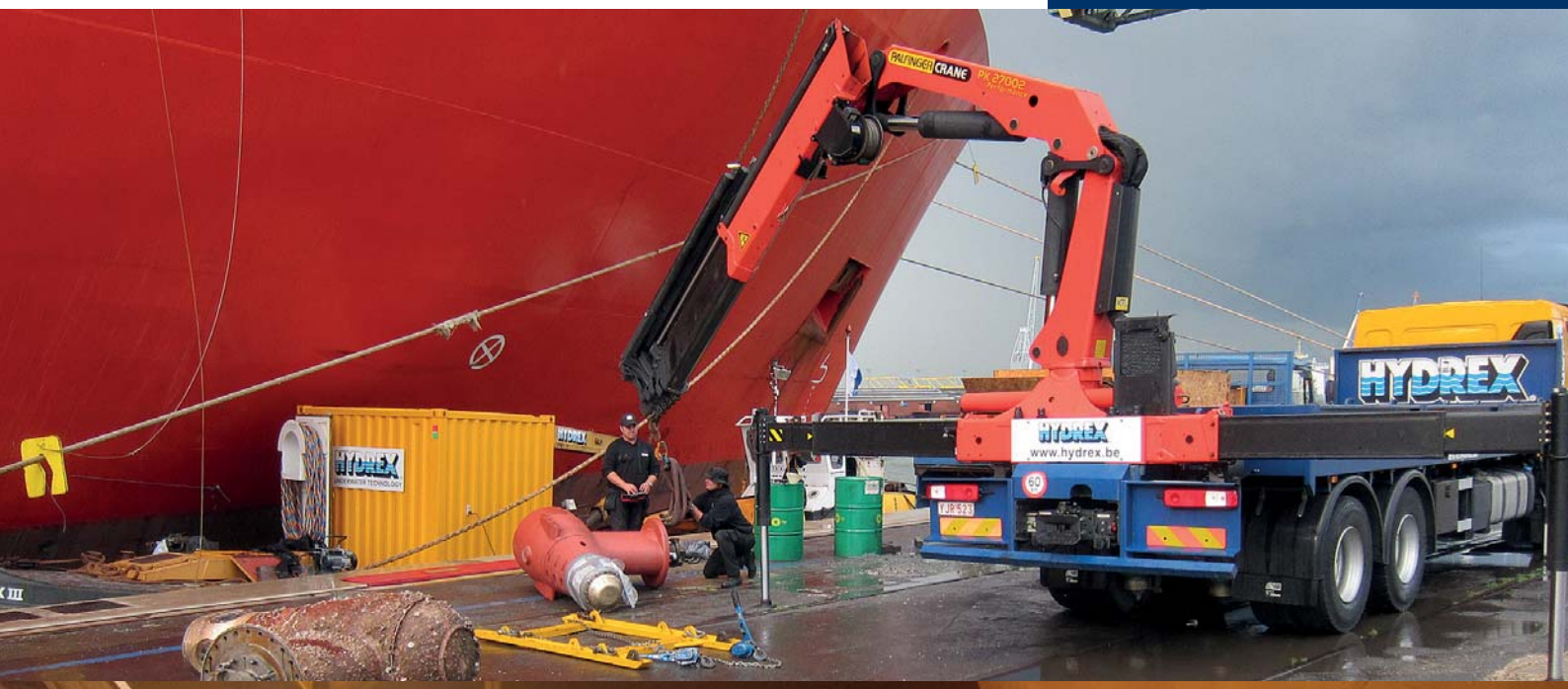
HYDREX®

UNDERWATER TECHNOLOGY

NEWS

LETTER | 191



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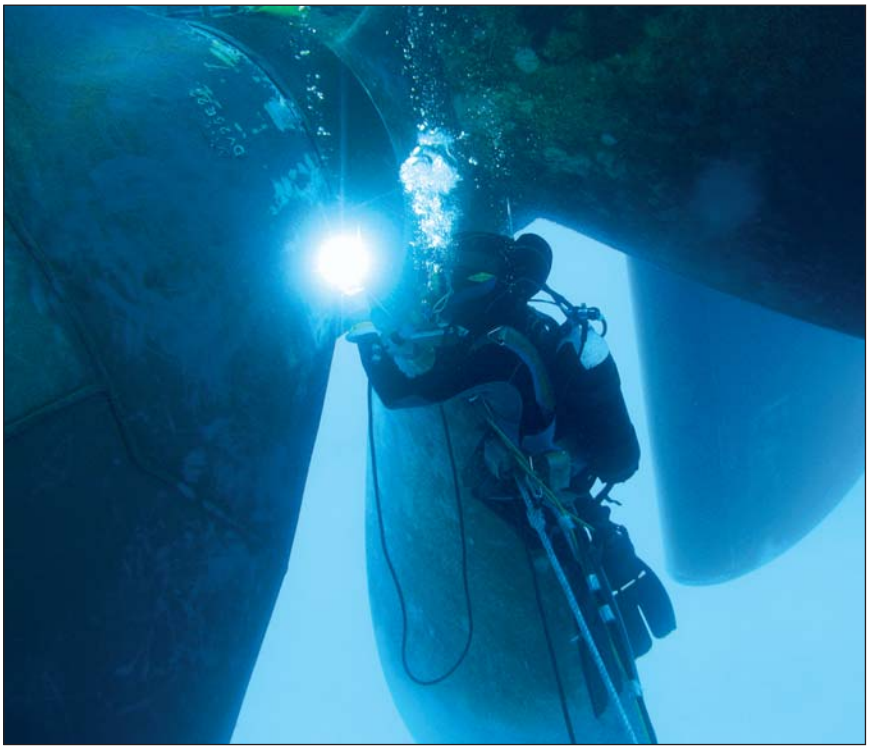
ISO 9001 certified

Underwater services and technology approved by:

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 and maintenance services are done while the vessel is on-site. This eliminates the need to drydock.

All used methods are fully approved by all major classification societies.

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Underwater bow thruster removal and reinstallation in Antwerp

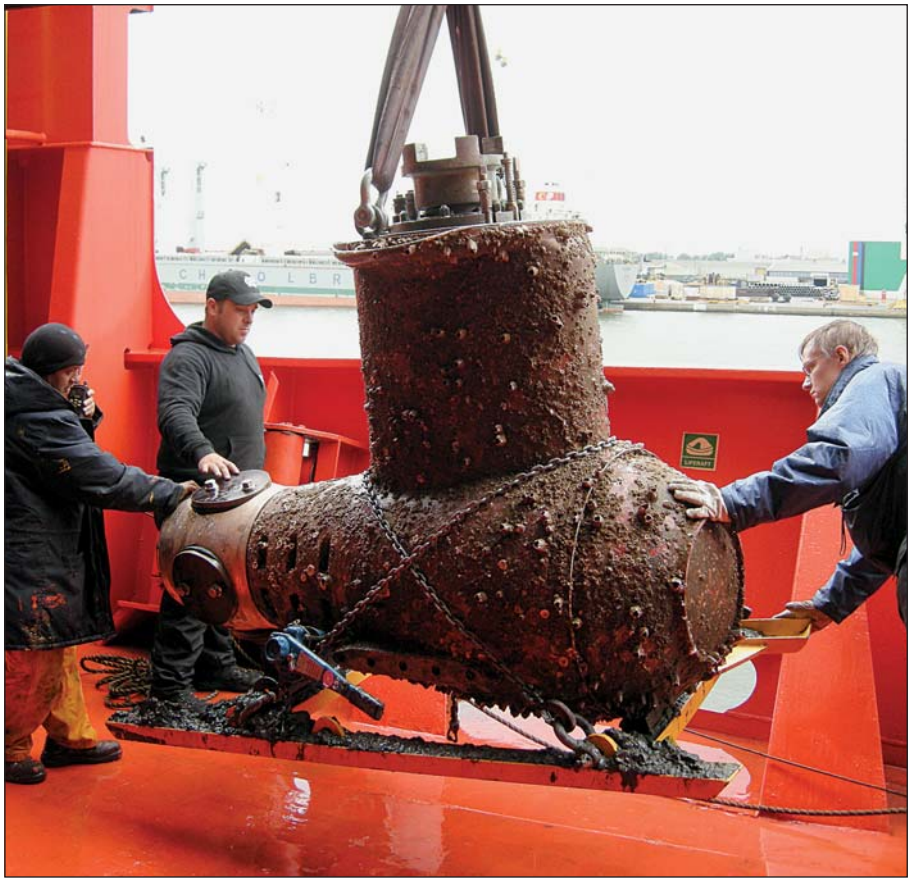
In July, Hydrex performed the removal of a bow thruster that needed to be overhauled, and reinstalled a spare unit in one take. Both parts of the operation were carried out during a 200-meter container vessel's stop in Antwerp.

A diver/technician team carried out a preliminary inspection and took the necessary measurements prior to the ship's journey to Antwerp, while the ship was berthed in Algeciras. This allowed the Hydrex technical department to prepare 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 fastest possible time and without any loss of quality.

Together with all the necessary equipment, the team mobilized from the headquarters in Antwerp to the vessel's location. One by one the diver/technicians detached the blades and replaced them with blind flanges to prevent oil from leaking from the thruster. 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 the unit was taken out.

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

Hydrex diver being prepared for underwater bow thruster operation.



Old bow thruster unit being inspected by Hydrex team leader and representatives of the manufacturer.

Fast underwater ship hull repairs save time and money

Hydrex on-site hull repair services include the renewal of both small and large areas of damaged hull plating. These repairs can be carried out above or below water, according to the circumstances, with tailor-made mobdocks. Normal commercial activities can therefore continue without disruption. These operations follow the Hydrex procedure for welding cracks in the vessel's shell plating and they are approved by the major classification societies.

Hydrex diver/technician teams carry out these on-site hull repairs all over the world. In most cases the damaged area can be replaced with a permanent insert and no condition of class is imposed. On the rare occasions where the damage does not allow such a repair, a temporary doubler plate is installed over the affected area. This allows the owners to keep to their schedule and have a permanent repair carried out during the next scheduled drydock visit.

To offer the fastest possible service to customers, Hydrex offices have fast response centers where an extensive range of state-of-the-art tools and diving support equipment is available at all times for the repair teams.

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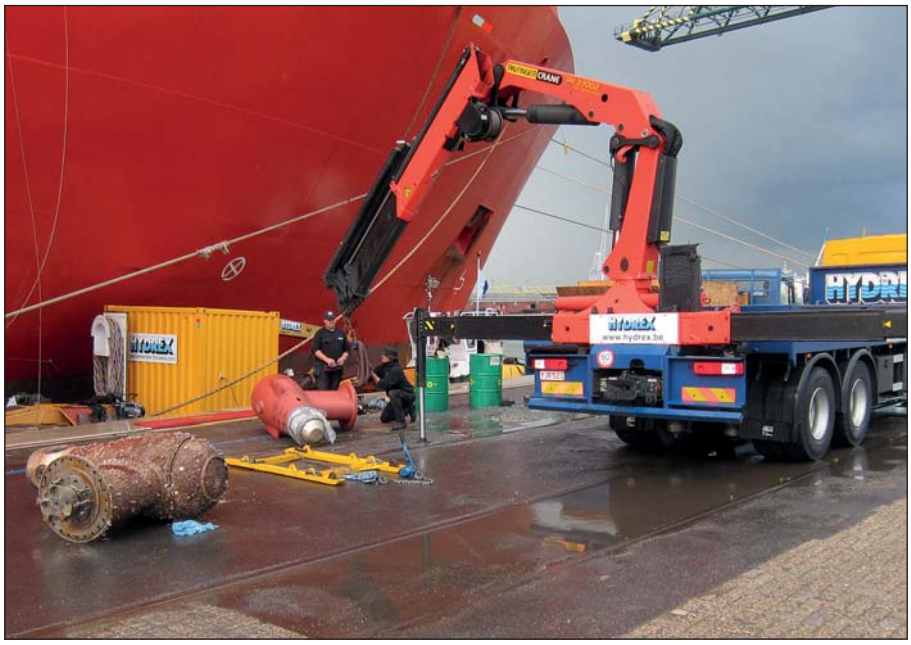
Hydrex certified welder preparing the engine room.



New bow thruster unit ready to be lowered into the water with old unit ready for overhaul.

surface. Simultaneously the team installed a blind flange to seal off the thruster tunnel from the engine room. Once the old unit has been overhauled it will be used as spare thruster for future operations.

Next the new bow thruster unit was put on a cradle which was designed specially for bow thruster operations and which prevents the unit from tipping. As it can be adjusted to the size of the thruster, it allowed the Hydrex divers to bring the unit back into the thruster tunnel in one take.

The diver/technicians then sealed off the thruster tunnel with the Hydrex flexible mobdocks and emptied all water from it. This created a dry working environment for them in which they could complete the reinstallation of the bow thruster unit in drydock-like conditions. Next they

Bow thruster blade being lowered into the water.

The thruster tunnel was closed off with the Hydrex flexible mobdocks and emptied of water.

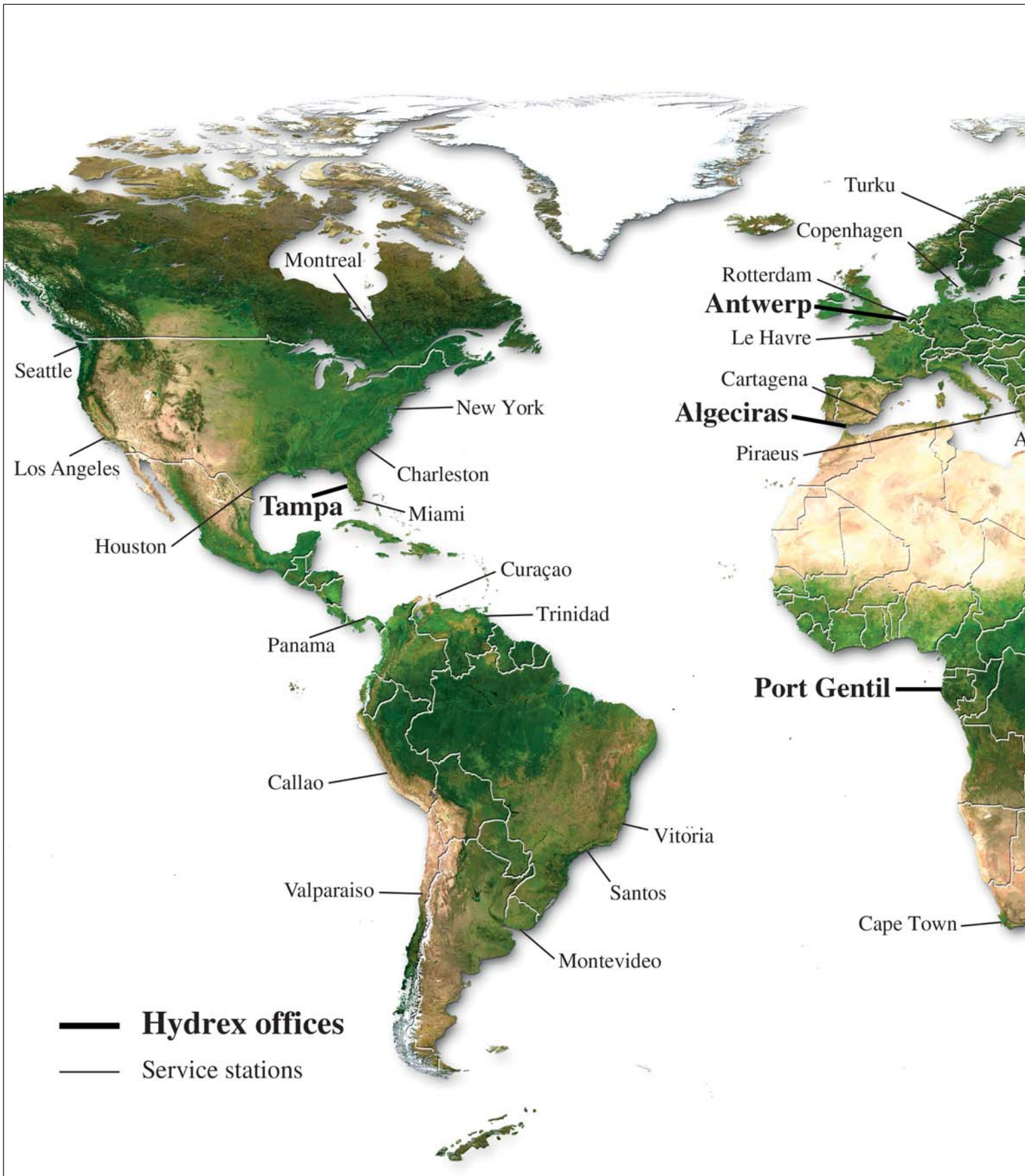
Monitoring station on workboat next to container vessel.

repositioned the gearbox using chain blocks and secured it with bolts. The thruster propeller blades were then reinstalled one by one. The team completed the operation by reconnecting the thruster unit to the engine room.

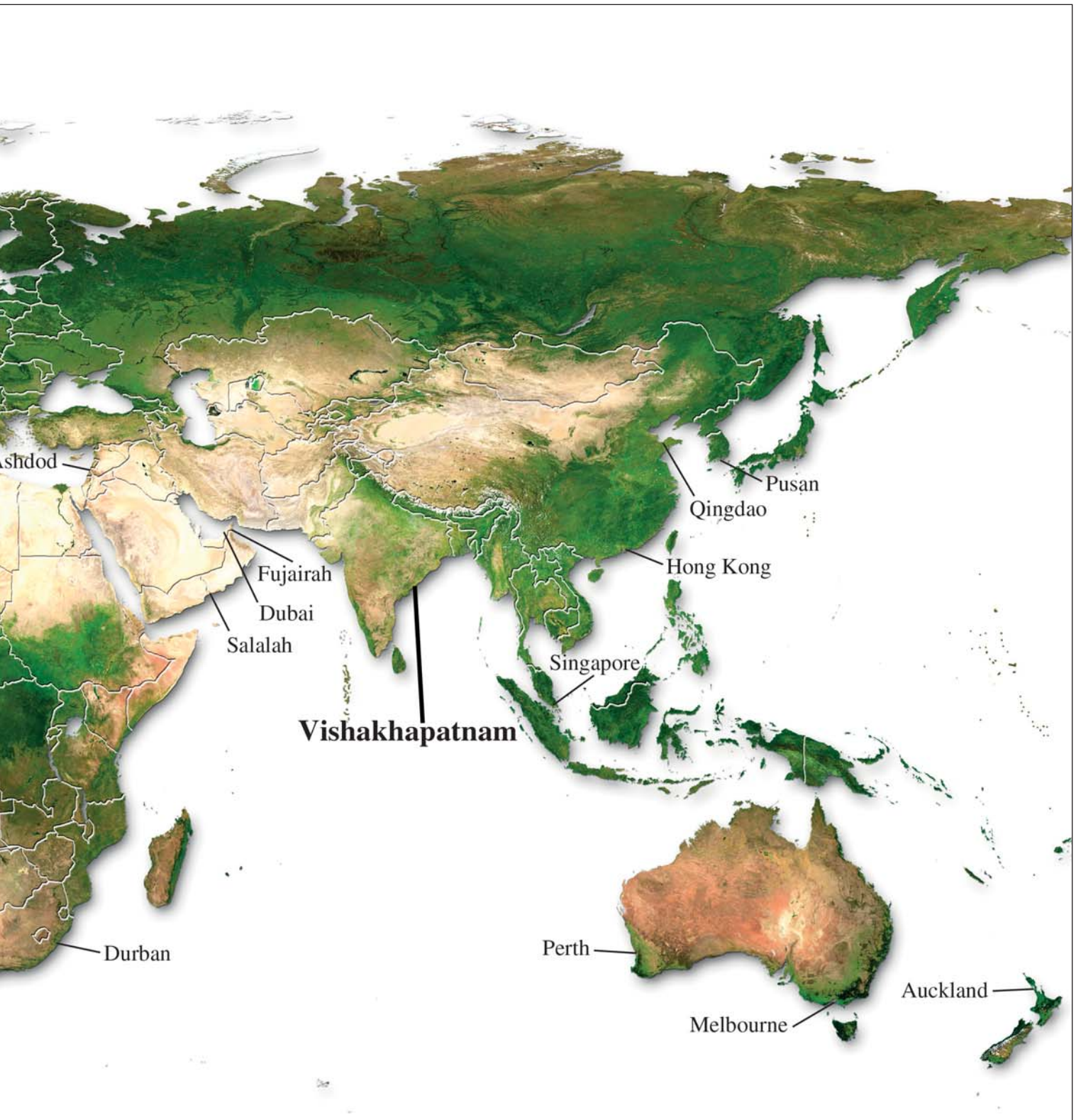
Hydrex took on, organized and executed the entire job, start to finish, relieving the customer of all the hassle of coordination, planning and supervision. This was done in close cooperation with the customer and third party suppliers.

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 go into drydock, saving the owner valuable time and money. ■

Worldwide network of of



fices and service stations

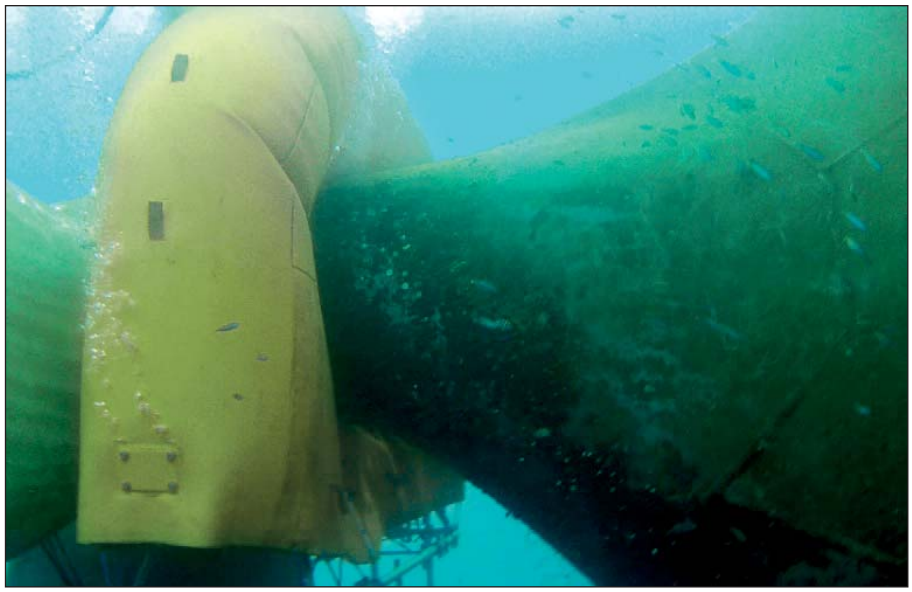


KEEPING SHIPS IN BUSINESS

Underwater stern tube seal repairs in Panama and the United Arabic Emirates

In July, Hydrex diver/technician teams carried out underwater stern tube seal repairs on a 271-meter oil tanker in Fujairah, and on a 195-meter roro vessel in Panama. Because both vessels were experiencing oil leaks, a fast repair was required by the classification societies. Using the company's flexible mobdocks, Hydrex teams were able to perform both operations on-site and underwater, saving time and money for both owners.

Both stern tube seal repairs had to be carried out in less than perfect conditions. The water temperature in Fujairah was close to 45° Celsius while stormy weather caused strong swell. In Panama the circumstances were slightly less tropical, but still far from ideal. This brought about no problem for the Hydrex diver/technicians. They are trained to be flexible and adapt to constantly changing working conditions. On top of this, our technical department has many years of experience in dealing with all kinds of weather circumstances in locations around the world. The combination of this theoretical knowledge and the means for a practical execution, allowed Hydrex to perform both stern tube seal repairs in these harsh circumstances. This was done under the strictest possible safety regulations, to the highest quality standards and without any unnecessary delay.



The Hydrex flexible mobdock is used to create a dry working environment underwater.

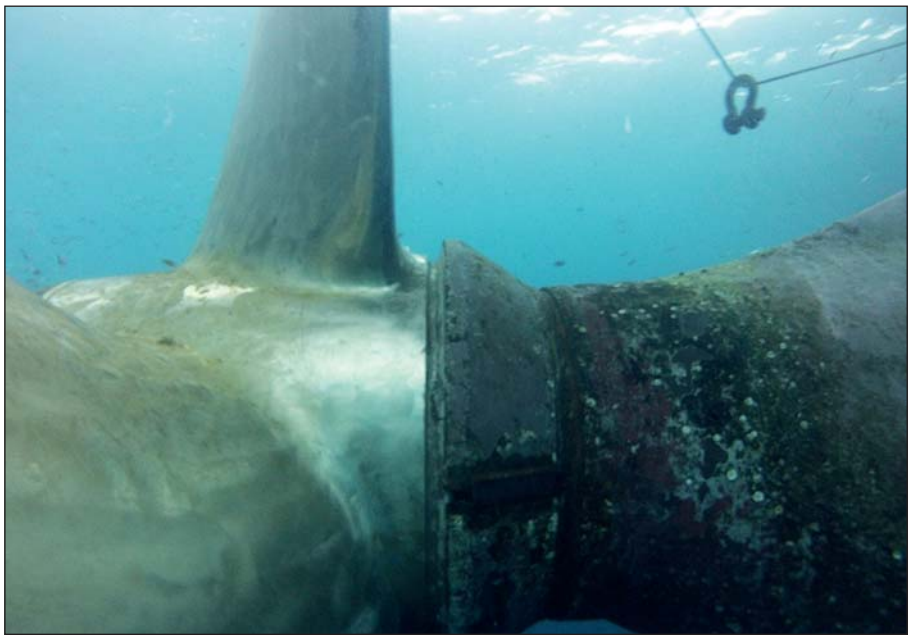
Hydrex has carried out on-site, underwater repairs and replacements on all types of seals for a number of years now by creating a dry environment underwater, in which the divers can work. The technique has won prestigious Lloyd's List Awards on two occasions. Several major classification societies have also awarded Hydrex certificates that accept the

Stern tube seal assembly before seal replacement.

Hydrex revolutionary flexible mobdock technique to perform permanent underwater seal repairs which previously would have had to be done in drydock.

Fujairah, U.A.E.

The lightweight flexible mobdocks packed in flight containers allowed for a very fast mobilization and a timely arrival in Fujairah of the Hydrex team. A storm was passing over when the team arrived at the oil tanker's location. This meant that the Hydrex divers had to pause the repair on several occasions due to strong swell and could only start the underwater operations again when the weather had improved slightly and full safety could be guaranteed for the divers. This only caused minimal delay and did not prevent the job from being completed on schedule.



Rope guard covering the stern tube seal assembly prior to removal.

After the inspection, the team removed the rope guard of the vessel. Fishing lines tangled around the liner had caused the oil leak. These were removed by the diver/technicians. The team then installed the flexible mobdock around the stern tube seal assembly creating a dry underwater environment for the divers to work in drydock-like con-

Cold straightening of severely bent propeller blades

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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Inside the flexible mobdock Hydrex divers can work in drydock-like conditions.

After removal of the rope guard, the diver/technicians can inspect the assembly.

ditions, a necessity for permanent stern tube seal repairs. Next the split ring was disconnected and brought to the surface to be cleaned. Subsequently the team removed the three damaged aft seals one by one and replaced them with new ones.

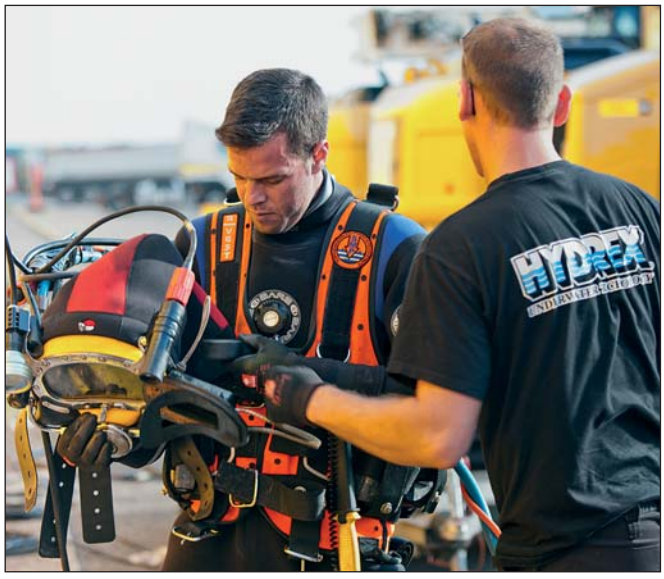
Panama

When oil was leaking from the stern tube seal assembly of a roro vessel, Hydrex diver/technicians mobilized to the vessel's location in Panama, together with all the needed equipment. After the diving team had set up a monitoring station, the operation started with a thorough underwater inspection of the stern tube seal assembly.

The underwater inspection revealed that a fishing line had caused the leak. The team removed the rope guard and installed the flexible mobdock around the assembly. After cleaning the entire assembly, the divers removed the first seal and replaced it with a new one which was then bonded. This procedure was repeated with the other two damaged seals. The team also installed a spacer ring, thus creating a new running area for the seals.

Both operations ended with the conducting of pressure tests with positive results, the removal of the flexible mobdock and the reinstallation of the rope guard.

Off hire causes a substantial loss of money. The teams therefore worked in shifts to perform the stern tube seal repairs within the shortest possible time frame. This saves both owners the time and money which going to drydock would entail. ■



Hydrex diver/technician being prepared for underwater stern tube seal operation.

The damaged seals were removed and replaced one by one.

Fast and high quality on-site repair services in theWestern Mediterranean area and North Africa

The Hydrex office in Algeciras is ready to mobilize immediately with their two dedicated dive support vessels. Both vessels are fully equipped as service stations for a wide range of repair operations and allow for a fast response in the bay of Algeciras, Gibraltar and North African ports.

As part of the Hydrex group, Hydrex Spain takes advantage of the company's 38 years of experience. All operations are carried out by highly certified diver/technicians all of which have been trained in the headquarters in Antwerp and have extensive experience, enabling the office to offer their customers the high quality Hydrex is known for.

Jobs recently carried out by Hydrex Spain include a propeller modification, pipe repairs, rudder repairs and stern tube seal repairs in Algeciras, propeller modifications in Cadiz and an azimuth bow thruster removal and reinstallation on a pipe laying vessel in Cartagena.

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Permanent 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 lightweight and can be mobilized very rapidly in our special flight containers. Therefore this new service is now available worldwide.

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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Fast underwater repairs keep ships out of drydock

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), Algeciras (Spain), Visakhapatnam (India), and Port Gentil (Gabon).

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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