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KEEPING SHIPS IN BUSINESS

ISO 9001 certified

Underwater services and
technology approved by:



BUREAU
VERITAS



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.

KEEPING SHIPS IN BUSINESS

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In record time Hydrex performs operations all over the world

In a period of only ten days Hydrex diver/technician teams have flown all over the planet to perform a wide range of underwater operations on five different continents. The services offered ranged from routine inspections and maintenance work all the way through to highly technical major repairs.

Among these jobs were two welding operations in the U.S.A., a propeller blade replacement in Bermuda and an azipod thruster operation in Japan. A stern tube seal repair and a spinner cone replacement were performed in Singapore, while a hull repair was carried out in Uruguay and a cofferdam operation was completed in India. Hydrex diver/technician teams also performed a doubler plate repair in Belgium, underwater cleaning work in the U.S.A. and the Bahamas on vessels coated with the Ecospeed hull coating system, and hull monitoring surveys in Spain, Gabon, the Netherlands, and Equatorial Guinea. Be sure to read our upcoming magazines for detailed accounts and pictures of some of these operations.

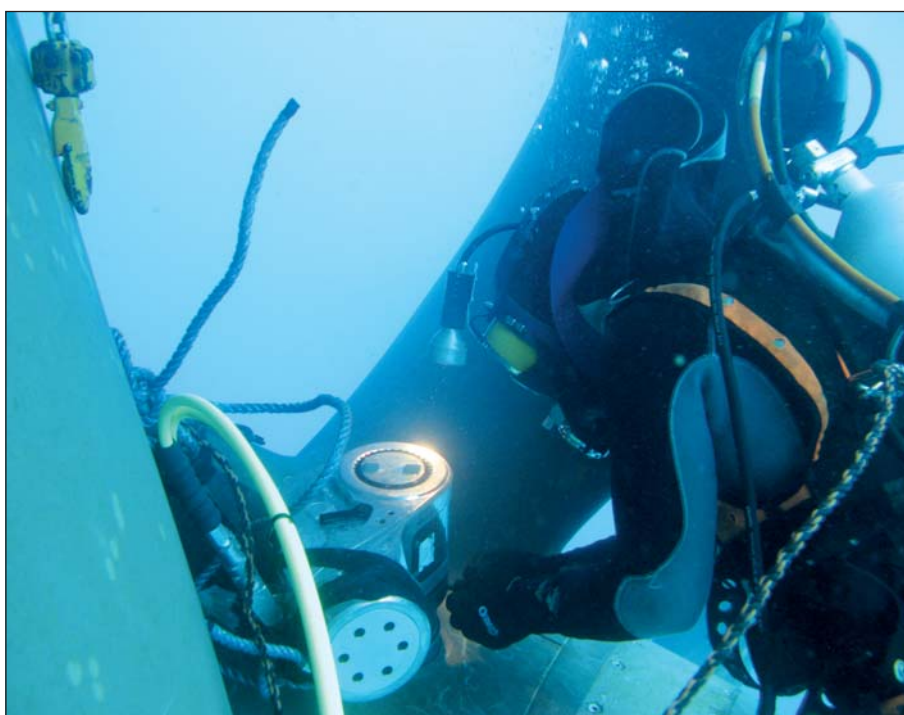
“Because these jobs often had to be performed back to back or simultaneously, establishing a flawless line of communication between our technical department and the different diving teams was essential,” says Hydrex Production Executive Dave Bleyenbergh. “In order to get the right person with the right knowledge at the right location during such a hectic period, perfect planning is crucial.”



One of the two dedicated dive support catamarans ready for an immediate mobilization from the office in Algeciras.

With close to 40 years of experience and well trained diving teams at its disposal, the Hydrex technical department knows how to handle

this kind of situation without loss of quality or unnecessary loss of time for the customer.



Hydrex diver/technician during propeller blade replacement in Bermuda.

Fast and high quality on-site repair services in the Western 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 companies' 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.



UNDERWATER TECHNOLOGY

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Hydrex offers large repairs as well as routine operations like underwater hull surveys.

All these operations were engineered and carried out in close cooperation with the customer and any third party suppliers. Whether it entails a simple maintenance operation or a complex repair or replacement of a ship's external underwater equipment and machinery, Hydrex can take on, organize and execute the entire job, start to finish. This relieves the customer of all the hassle of coordination, planning and supervision. The technical depart-

ment begins with evaluating the feasibility of an underwater operation, continue through mobilization of diver/technicians and equipment, and go all the way through to a successful execution and subsequent follow-up.

To be able to do this, Hydrex has an in-house R & D department that can take care of the engineering aspects of an operation. In this way turnkey solutions can be offered



Diver/technician during azimuth thruster operation in Japan.



All Hydrex divers go through stringent training, allowing them to perform the wide range of underwater services Hydrex offers.

for both everyday operations and intricate repairs that require the construction of specific equipment. In all cases the research and development is aimed at reducing cost and off-hire time for customers while maintaining the highest quality

standards of repair and maintenance.

Through an ever-expanding, worldwide network of offices and service stations, Hydrex can provide a wide range of services economically at

any location. Headquartered in the Belgian port of Antwerp, Hydrex has offices in Tampa (U.S.A), Algeciras (Spain), Mumbai and Vishakhapatnam (India), and Port Gentil (Gabon).

From these locations, specialized repair and diver teams can be mobilized immediately to almost anywhere in the world. All the lightweight equipment used by the teams is stored in fast response centers which are designed especially for the purpose of speed and are equipped with all the latest facilities and tools. A good example of the easy to transport equipment is a range of unique flexible mobdocks which are used to perform stern tube seal, thruster, rudder and other permanent repairs that require a dry working environment. By bringing drydock conditions to the ship, customers can save the time and money that is lost by going off hire and into drydock.



Specialized repair and diver teams can be mobilized immediately from the Hydrex offices.

CLASS ACCEPTED UNDERWATER STERN TUBE SEAL REPAIRS UNDER WARRANTY



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 top specialist suppliers.

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.

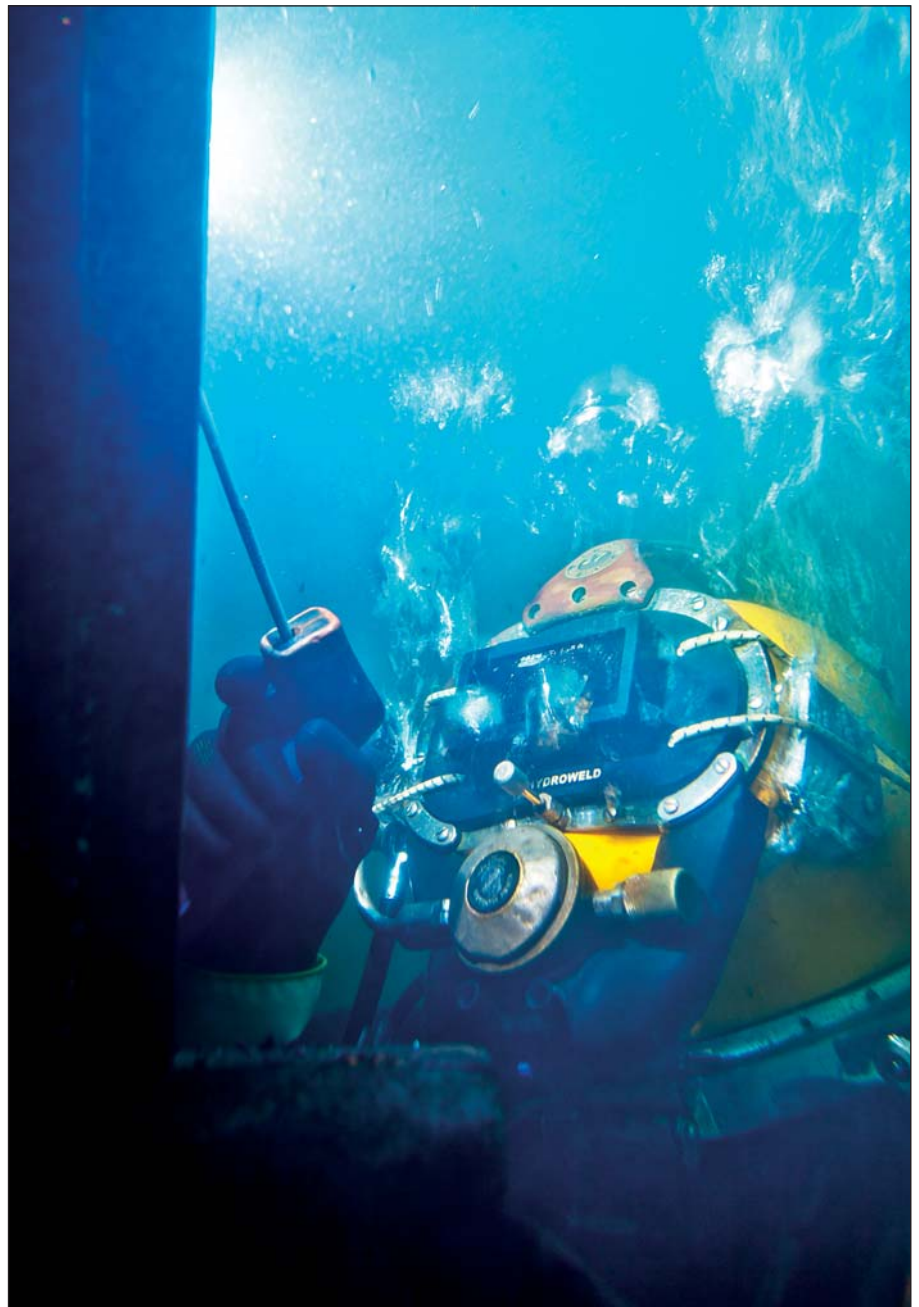


Hydrex diver training programs

One of the reasons Hydrex can offer its customers the high quality of service they deserve is the stringent training all divers go through, whether they work for the Hydrex main office in Antwerp or for one of the other offices. Besides being required to have official international commercial diver certificates and taking high standard external courses, including offshore courses, they also receive comprehensive in-house training.

This consists of both theoretical classes in the course room 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 tanks in which to learn and practice advanced underwater welding and other repair work.

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



All Hydrex divers go through a stringent training, both in-house and external.



Hydrex can mobilize diving teams almost immediately to any location in the world.

themselves and to take advantage of the technical knowhow and practical knowledge Hydrex has accumulated over the last 40 years. When their

training is completed, Hydrex divers are skilled to perform a wide range of operations. They can carry out both simple and complex jobs even

in harsh circumstances and achieve this uniformly without unnecessary loss of time or quality.

Every day a ship is out of service causes a substantial loss of money. In order to provide the customer with the fastest possible response, flexibility is essential throughout any repair or maintenance operation. Keeping a ship in business is a very complex task that does not end at the close of an office day. For this reason all Hydrex offices can be contacted 24/7 to assist customers with any problem related to a vessel's underwater hull and equipment, whether great or small, whether emergencies or long term projects. Our technical departments are ready to create a tailor-made solution for your specific needs. ■

ON-SITE BOW THRUSTER OPERATIONS

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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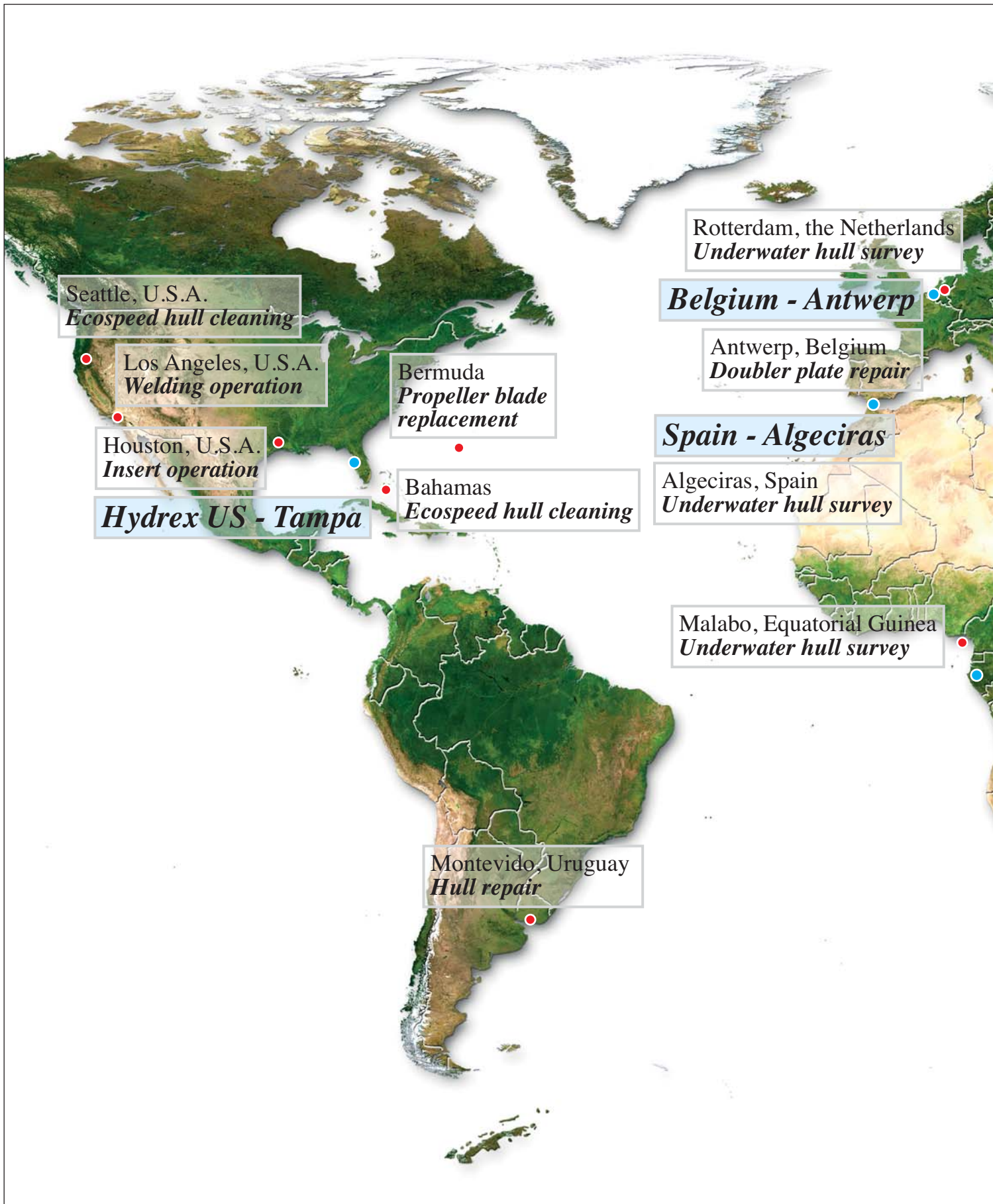
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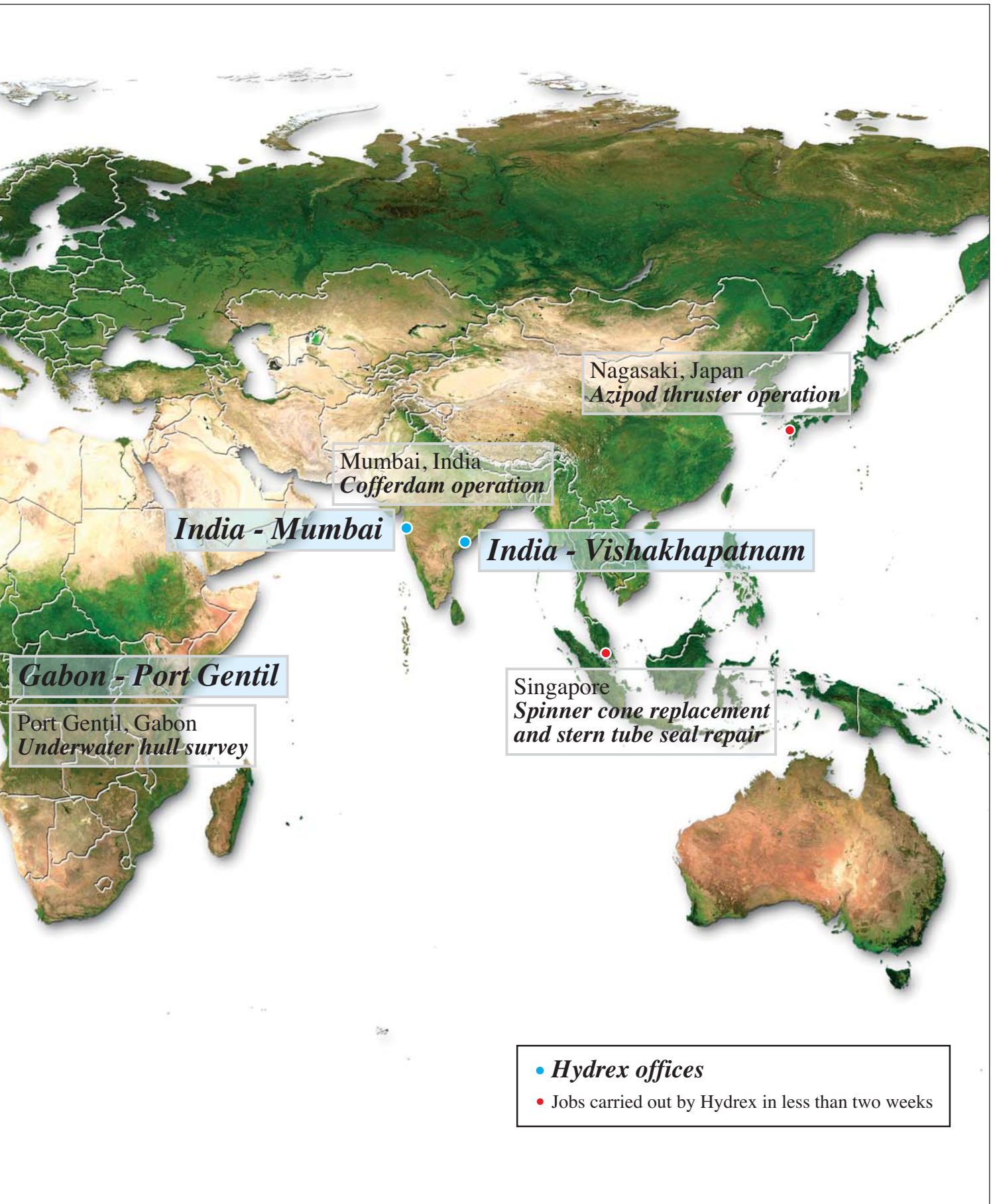
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In record time Hydrex performs



operations all over the world



Hydrex White Paper No. 11

Extending the Interval Between Drydocking

From a hull protection and fouling control point of view, a ten year drydocking interval is perfectly feasible and very economical

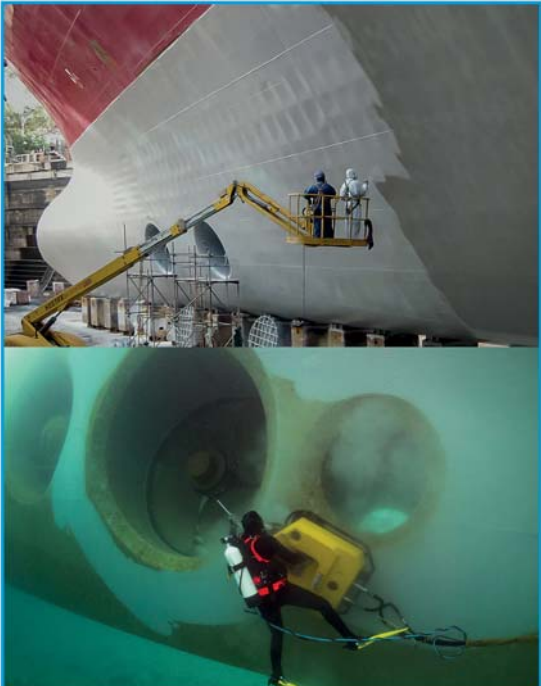
Drydocking a ship is a complex, expensive, time-consuming and stressful activity, regarded by most ship owners, operators, officers and crew as a necessary evil. Time spent in drydock is time spent out of service. It is becoming increasingly difficult to find drydock time available when and where one would like it, particularly for larger vessels. Thus drydocking often takes a vessel well away from its normal operating route. Many different activities need to be scheduled for accomplishment during a drydocking and these activities may interfere with each other. The weather can be an important factor, particularly since drydocking usually involves painting.

That drydocking is necessary is not in question. In order to keep ships operating safely and efficiently for 25 years or more they have to be taken out of the water periodically for inspection and any needed repair. What is in question is how often this needs to occur. Technology is advancing and conditions which were prevalent twenty or thirty years ago are not necessarily present today.

Currently the usual interval between mandatory drydocking for most ships is five years, depending on type and age of ship. This has been extended to seven and a half for certain ships. A ten-year drydocking in-

WHITE PAPER

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From a hull protection and fouling control point of view, a ten year drydocking interval is perfectly feasible and very economical

www.shiphullperformance.org

HYDREX WHITE PAPER N°11

terval is a dream for most ship owners, operators, officers and crew – one which, if it could be attained, would reduce operating expenses and lower the cost of marine transport.

The challenge to extending the drydock interval

The main challenges to a ten or even twelve year interval between dockings are hull protection and fouling

control. By “hull” here is meant the entire external underwater part of a ship including the wetted hull, the rudders, propulsors, stabilizers, thrusters, sea chests, bilge keels, cathodic protection system and all the other external, submerged features and appurtenances of a vessel.

The continual attack by salt or fresh water, cavitation, oxidation, abrasive particles (gravel, lava, sand), ice and occasional solid contact renders these parts of a ship particularly prone to damage, erosion, corrosion and general reduction or weakening of the steel, aluminum or other material from which they are made. Salt water is potentially more damaging than fresh.

The accumulation of biofouling in the form of plant and animal life which naturally adheres to any submerged object, manmade or not, causes the hull to become rougher and can also damage the protective coating. This in turn adds friction or drag to the hull and propellers. The result is that more fuel must be burned to achieve the ship’s cruising speed. The rougher the hull and propellers become, the higher the fuel penalty incurred. This not only shows up in higher costs to the operator but also in increased environmental impact through additional noxious gas and particulate matter emissions resulting from the higher fuel consumption. With conventional coatings, the longer the vessel remains out of drydock, the rougher the hull will become.

In addition to this fuel penalty, biofouling on the ship’s hull has recently come to be regarded increasingly as a vector for the translocation of invasive, non-indigenous marine species from one environmental zone to another. Precautionary guidelines and regulations are being pro-

posed and enacted to combat this threat. In general terms, the more fouled the hull, the greater the risk of spreading NIS.

Answering the challenge

The protection of the hull over a ten or even twelve year period can be accomplished with currently available coatings if the appropriate system is used.

This leaves fouling control as the perceived largest challenge to an extended drydock interval. The concern is that conventional approaches to hull protection and fouling control will not perform over that period and that the fuel penalty incurred from increased hull roughness would therefore make a drydock interval of ten or twelve years too expensive in terms of added fuel costs, especially with the price of fuel as high as it currently is.

This White Paper presents the case for a system of hull protection and fouling control which can easily last

for ten or twelve years without any need for drydocking and can keep the ship’s hull well protected and virtually free of biofouling for that length of time, thus avoiding the fuel penalty and preventing the translocation of NIS.

The type of system described herein is non-toxic and environmentally benign. It is also cost-effective and will, when standardly applied and maintained, result in considerable savings for both owner and operator over the service life of a ship when compared to conventional coating systems.

Since hull protection and fouling control are considered the biggest challenges to a longer interval between mandatory drydocking, this White Paper focuses on these without going into detail on other aspects of mandatory drydocking such as tail shaft removal and other inspections and repairs required by IMO or State regulations and classification societies. ■

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UNDERWATER TECHNOLOGY

























Fast underwater repairs keep ships out of drydock

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 Tampa (U.S.A), Algeciras (Spain), Mumbai and 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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