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## KEEPING SHIPS IN BUSINESS

### ISO 9001 certified

Underwater services and technology approved by:



## Permanent rudder repairs now possible without drydocking



**H**ydrex 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.

**HYDREX**  
UNDERWATER TECHNOLOGY

Phone: + 32 3 213 5300 (24/7)

Fax: + 32 3 213 5321

hydrex@hydrex.be

[www.hydrex.be](http://www.hydrex.be)

# The evolution of stern tube seal repairs

## *An interview with Hydrex founder Boud Van Rompay*

**H**ydrex was established in Antwerp in 1974 by Boud Van Rompay. Since then it has steadily grown into a company the shipping and offshore industry can depend upon whenever there are tough and difficult jobs to do as well as for regular, routine maintenance and repair tasks.

Hydrex has built a reputation as the leading underwater repair and replacement specialist in the world. Providing a service that is both versatile and effective, the company has gained a standing as the most innovative and reliable company of its kind. We had the opportunity to meet with Boud to talk about one of the many technological developments Hydrex has pioneered in the last 40 year: Underwater stern tube seal repairs.

**Hydrex:** *Can you give us a brief overview of the development of stern tube seal repairs?*

**Boud Van Rompay:** In 1998 our divers completed a seal repair training course led by John Crane Marine, who also worked together with Hydrex in the testing of new developments. At the end of 1999 we successfully started working with face type seals in Havant, near Portsmouth in England on what we considered to be the last barrier in replacing stern tube seals. It was a new and novel approach that was based on the strength of the mobdock (short for mobile mini drydock) applications that we had developed in the 70s, 80s and 90s.



*Hydrex founder Boud Van Rompay.*

**Hydrex:** *I assume this was only the beginning?*

**Boud:** Those early repairs were carried out on face type seals, that do not necessarily need a dry chamber or a dry habitat to work in. Soon it became apparent that we needed to find a solution for the lip type seals. We took it up again when we discovered it could be done with an inflatable habitat. We designed and manufactured such a habitat in cooperation with a supplier with whom we had previously worked, during the development of our bow thruster equipment. This new flex-

ible mobdock enabled us to do a stern tube seal replacement in the dry as soon as 2002. The first application for that particular type of operation was done on a cruise vessel at the end of 2005. We replaced a 632mm diameter seal. This first success was a real breakthrough. After that it quickly became obvious that we could replace all types of seals. We performed ten more seals in the first year, for various manufacturers. These jobs went well: on



## Fast underwater ship hull repairs save time and money



**H**ydrex 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.



*Damaged stern tube seals can be replaced on-site and underwater.*

each occasion the execution was done within the time frame that we had estimated. This usually is about two days.

**Hydrex:** *And since then you've never looked back?*

**Boud:** Our experience has been that it is quite feasible and very safe to do. We have managed to do all these stern tube seal operations within the allot-

ted time frames and with the normal warranties on the quality of the work. It's not always straightforward to replace seals, because there can be quite a bit of variation in the configurations of the stern tube itself. There can also be complications with the liners, which can be worn down and show ruts. All this is routinely handled by the teams on the jobs. We typically work with 6-man teams that are perfectly capable of doing the work within the normal two days. We usually supply the equipment and the owner is free to supply his own seals. We can handle all type of seals from all manufacturers.

**Hydrex:** *This type of repair sounds very interesting for owners, because ships don't have to go to drydock.*

**Boud:** The big advantage of stern tube seal replacements is that we can perform them in-situ, which means there is no need to take the ship to drydock. This saves you sailing time to the drydock, actual time in drydock, tugboat costs, demobilization and, especially for container ships or ships with cargo, you do not have



*Hydrex has developed a habitat that creates a dry working environment around the stern tube.*



*Preparation of a stern tube seal assembly for installation of the Hydrex mob-dock.*



*All the necessary equipment can be transported in lightweight flight containers.*

to discharge and load/reload the vessel and provide for cargo space on the shore. We can service both loaded or unloaded ships, as we also provide afloat repairs. Afloat or underwater, the jobs are carried out very fast. There's no interruption of commercial operations. All problems that can occur with stern tube seals are solved on-site, whether it's an oil leakage or a total breakage of the seals.

Stern tube seal problems are a pain to have; oil leakages can be a major hindrance and produce a potential or actual liability when for instance going to the United States or other sensitive areas. When they have a leaking stern tube, ships are often not allowed to enter ports, or they can receive very heavy fines. A good example of this is the operation we performed on a general cargo vessel in Mobile, Alabama. Because the U.S. Coast Guard has very strict policies concerning environmental risks, they would not allow the vessel to sail to a different location before the oil leak had been permanently fixed. We therefore mobilized a certified diver/technician team to the vessel's location to perform emergency underwater stern tube seal repairs. In order to provide the customer with the fastest possible response, flexibility was essential throughout the entire operation. Hydrex was able to perform the repairs in a very tight time frame and made sure that the vessel could continue on its schedule free of oil leaks.

So for a minimal cost and without having to drydock the vessel we can replace the seals and the owner is not burdened with an impromptu



drydocking and the consequential problems such as time loss, financial loss, reputation loss ....

**Hydrex:** *It seems almost incredible that you can do this on a worldwide basis and so fast, what is the secret to that?*

**Boud:** All equipment that we need for this type of operation is available in two locations: At the Antwerp headquarters and at the Tampa Office in Florida. A third set will be stationed in Singapore very shortly. We have packaged our equipment in such a way that it can be sent in lightweight, aluminum cargo boxes that can go on any airplane. At the same time our divers have worldwide visas for almost all countries. So we have easy access to all lo-

cations and can immediately mobilize multi-disciplinary underwater technician teams together with equipment.

**Hydrex:** *Stern tube seal replacements are only a small part of the range of repairs Hydrex offers. Can you quickly touch upon some of the other main services?*

**Boud:** We can do other seals too, like propeller seals, bow thruster seals or anything that needs to be done on the rudder bearings. In this respect, we have recently developed a new spectacular way of performing dry and permanent repair or maintenance work on a rudder, which is quite a breakthrough. The Hydrex R&D department has also developed a repair system that allows Hydrex

to perform permanent underwater repairs to every type of propeller in dry conditions. All kinds of repair or maintenance work can be carried out to propellers, twin propellers, variable pitch propellers, azipod and swing-up thrusters. With the implementation of these techniques our diver/technicians can now perform permanent repairs to all parts of the underwater ship propulsion system in drydock-like conditions.

**Hydrex:** *Thank you for the interview* ■

## Hydrex US ready to mobilize immediately

**H**ydrex 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 serv-



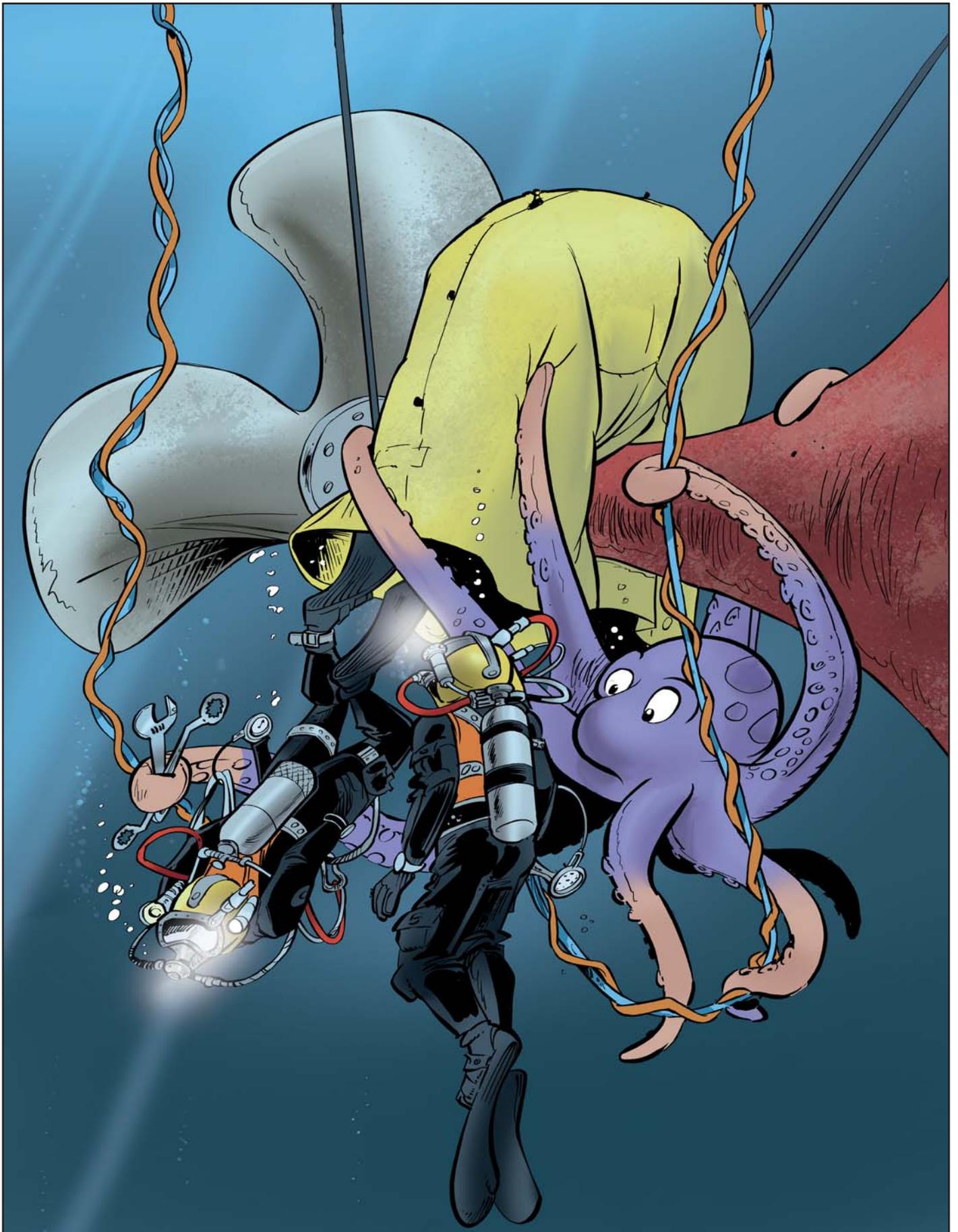
ices are done while the vessel is on-site. This eliminates the need to drydock.

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

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**KEEPING SHIPS  
IN BUSINESS**

**Hydrex US**  
604 Druid Rd,  
Clearwater, FL 33756  
Phone: +1 727 433 3900 (24/7)  
Fax: +1 727 433 3990  
info@hydrex.us



**HYDREX**  
UNDERWATER TECHNOLOGY

[www.hydrex.be](http://www.hydrex.be)

# Underwater PBCF installations in Antwerp and Ghent bring fuel savings

Last month Hydrex installed Propeller Boss Cap Fins (PBCF) on two tankers during their respective stops in Ghent and Antwerp. As a result of the underwater operation, the ships will not have to wait for their next drydock visit to start benefitting from the fuel savings the PBCF's will bring them.

The Propeller Boss Cap Fins (PBCF) is a device for propeller efficiency improvement developed by Mitsui O. S. K. Lines, Ltd. The PBCF can recover energy loss of a propeller hub vortex in the propeller's backward flow. This decreases fuel consumption by 5% when operating at the same speed, or boosts speed by 2% with the same fuel consumption.



*Hydrex workboat with equipment next to tanker in Antwerp.*

The 5% energy saving effect has been verified by world research institutes including International Towing Tank Conferences (ITTC) and by owners.

With the current emphasis on global environment problems, the demand for the PBCF has been continually growing and this as an energy saving device and an environment-



*The old propeller cap is removed in Ghent.*



*PBCF ready for installation in Ghent.*



*PBCF lowered from deck to the quay in Ghent.*



*Hydrex diver/technician doing a final equipment check prior to mobilization from headquarters.*

friendly product because it realizes a 5% reduction in CO<sub>2</sub>, NO<sub>x</sub> and SO<sub>x</sub> gases emission from vessels.

**On-site installation prevents a long wait for fuel saving benefits**

The first operation was performed on a 183-meter tanker berthed in Ghent. After the team arrived at the vessel's location with one of the Hydrex workboats, they started the operation with a full inspection of the propeller. Next the diver/technicians cleaned the area where the spinner cone (PBCF) was to be installed. They then lowered the cone into the water and positioned it on the propeller. When this was

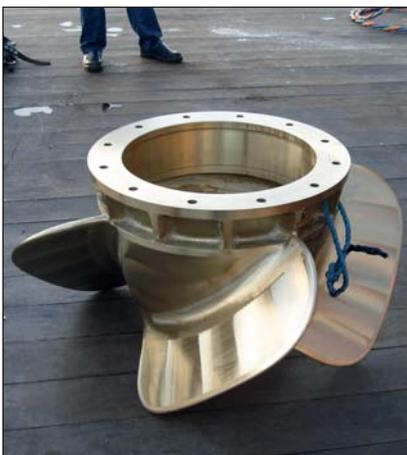




*PBCF brought from quay onto Hydrex workboat in Antwerp.*

done, grease was inserted in the space underneath the propeller cone for lubrication and the bolts were put on torque and secured with wire, finishing the replacement of the PBCF. The Hydrex team worked around the clock to finish the operation as quickly as possible.

The exact same procedure was used during the operation in Antwerp on a 130-meter tanker. The alignment of both Propeller Boss Cap Fins was monitored on an underwater video camera and supervised by the manufacturer's specialist on the workboat.

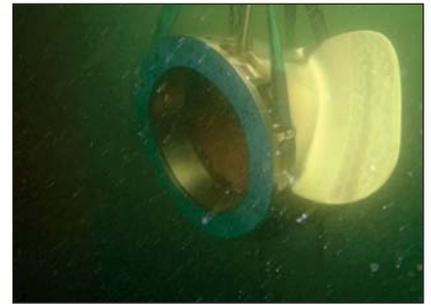


*New Propeller Boss Cap Fins prior to installment in Antwerp.*

Last year Hydrex had already replaced two PBCF's on a 110-meter tanker in Singapore. This was the first underwater installation of a PBCF, according to the manufacturer.

### **Summary**

By performing the operation on-site and underwater, the owner of both tankers could immediately start enjoying the fuel savings the system



*New spinner cone lowered into the water.*



*New spinner cone installed and secured in Singapore last year.*

offers. Otherwise he would have had to wait for the next scheduled drydocking before having the PBCF's installed. This would have cost him up to two years of savings. Calculations show that he will have earned back the money of the underwater installation in about eight weeks, so the savings for the customer are enormous. ■



*Final preparations of PBCF.*

# Swift on-site bow thruster operations



**T**he 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 with-out 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.



UNDERWATER TECHNOLOGY

Phone: + 32 3 213 5300 (24/7)

Fax: + 32 3 213 5321

hydrex@hydrex.be

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# Keeping ships in business

**H**ydrex 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) 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.



**Headquarters Hydrex N.V. - Antwerp**

Phone: + 32 3 213 5300 (24/7)

E-mail: [hydrex@hydrex.be](mailto:hydrex@hydrex.be)

**Hydrex Spain - Algeciras**

Phone: + 34 (956) 675 049 (24/7)

E-mail: [spain@hydrex.be](mailto:spain@hydrex.be)

**Hydrex LLC - Tampa, U.S.A.**

Phone: + 1 727 443 3900 (24/7)

E-mail: [info@hydrex.us](mailto:info@hydrex.us)

**[www.hydrex.be](http://www.hydrex.be)**