

COFFERDAMS: SOLUTION FOR STEEPLY SLOPING ROCK – ROBERT BITTNER, P.E.

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AN OVERVIEW OF
TECHNIQUES AND
SAFETY MEASURES

UNDER WATER

WELDING

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HYDREX TEAMS UP WITH WÄRTSILÄ TO REPAIR UNDERWATER STERN TUBE SEAL ASSEMBLY IN AUSTRALIA

Bunbury, AU

February 2014 — Last month a Hydrex diver/technician team carried out underwater stern tube seal repairs on a 110-meter offshore supply vessel in Bunbury, Australia. The rope guard covering the stern tube seal assembly was missing and the seal box had come loose after a mooring rope got tangled around the assembly. An emergency on-site repair was necessary. Hydrex therefore mobilized a diver/technician team to the vessel's location and was able to carry out the entire operation on-site and underwater. This operation saved the owner an expensive and time-consuming trip to drydock.

The replacement was carried out in close cooperation with the Seals and Bearings Services division of Wärtsilä Netherlands B.V. With the establishment of Seals and Bearings Services the company can offer a complete package of products throughout the world. All Wärtsilä products comply with the major classification societies and are carefully selected to make sure that the customer is given the

best available solution. Wärtsilä is specialized in providing sealing solutions for stern tubes, rudders, bulkheads, waterjets, thrusters, electric pods and special applications, such as tidal and industrial power. They also offer a vast selection of bearings for various applications including stern tubes, rudders, line shaft bearings, thrust bearings and generator bearings. The company has operations in 70 countries around the world. "The cooperation with Hydrex went perfectly," says Eric Krijgsman, Sales Manager for Seals & Bearings for Wärtsilä Netherlands B.V. "Ship owners are often not in the position to go to drydock due to financial reasons or time restraints. They then ask us to perform repair or maintenance work underwater. Thanks to Hydrex we can now offer on-site solutions to our customers."

The diving team first set up a monitoring station. The operation then started with a thorough underwater inspection of the stern tube seal assembly. This revealed that a mooring rope had gotten tangled around the assembly, badly damaging



Diver surfacing during night shift.



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

it. Besides the missing rope guard, the seal box assembly bolts were broken off at the base flange ring. As a result the remaining seal box rings were hanging loose on the liner. This allowed seawater to come into the stern tube. After the inspection the divers removed the broken

bolts and installed a Hydrex flexible mobdock around the stern tube seal assembly. By doing this they created a dry underwater environment so that they could work in drydock-like conditions.

The split ring was then disconnected and brought to the surface to be cleaned.



The rope guard was gone missing, as was the locking wire for the stern tube bolts.

After cleaning the entire assembly, the divers installed a spacer ring to create a new running area for the seals. Next they removed the first seal and replaced it with a new one which was then bonded. This was done in cooperation with the supervising Wärtsilä specialist flown in from Sydney. The procedure was repeated with the other three seals.

The operation ended with the conducting of successful leakage tests, the removal of the flexible mobdock and the installation of a new rope guard.

Hydrex has carried out repairs and replacements on all types of seals on-site and underwater, for almost twenty years now. We constantly invest in the research necessary to continue to evolve repair techniques and procedures. Over the years the Hydrex R&D department has improved the flexible mobdock (mobile mini drydock) technique to make it possible for our diver/technicians to perform permanent repairs on seals, thrusters and almost any other part of the underwater vessel without the need for drydock. The latest generation of flexible mobdocks allow us to carry out on-site replacement of

virtually any type of stern tube seals very quickly.

CONCLUSION

During the operation other repair and maintenance work was being carried out to the deck of the ship. This involved a large crane which extended over the water making it unsafe for diving operations to continue simultaneously. This meant that the Hydrex team had to halt the operation on several occasions. Hydrex divers are trained to be flexible and can handle constant changing and challenging circumstances. They worked in shifts to finish the stern tube seal repairs as quickly as possible. Despite the interruptions, the operation was carried out without any reduction of quality. According to the Vessel Manager of the offshore supply ship the combined Hydrex and Wärtsilä team "has done a good and impressive job." The owner could sail his vessel free of water ingress and without having to go to drydock. ■

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