

March 2012

# Shipping World & Shipbuilder

INFORMING  
THE INDUSTRY  
SINCE 1883

NOMINATED BEST MARITIME MEDIA MAGAZINE 2011



***Oil majors in  
conflict over cylinder oil***

***Noise affects  
hull performance***

***Guidance for new  
waste requirements***

***Gas ships coming on stream***

SHIPBUILDING...DESIGN...REPAIR...MACHINERY...TECHNOLOGY...SERVICES

# Fixing seals on-the-go

## ON SITE REPAIRS OF SEALS MEAN OWNERS CAN AVOID THE INCONVENIENCE AND COSTS OF VISITING A DRYDOCK

In-situ repairs and replacement of seals help owners extend their vessels' drydock interval and eliminate the loss of time and production brought about by drydocking. One company that has carved a niche in this particular business is Hydrex, which has built up a considerable track-record thanks to its policy of swiftly responding to all kinds of break downs.

Since Hydrex divers first carried out an underwater face seal replacement 15 years ago, it has constantly worked to advance the techniques used for all kinds of seal repairs. This led to the development of its flexible 'mobdock', a mobile mini drydock, technique which enables its engineers to create a dry underwater working environment around a seal assembly. The technique made it possible to replace stern tube seals in their entirety underwater.

In one recent case, the mobdock technique was used to reposition the aft stern tube seal assembly of a 210m container ship in Le Havre. A Hydrex diver/technician team performed the operation to stop an oil blockage that occurred just after the vessel came out of drydock.



Diver working on a seal assembly

After the rope guard was removed the diver/technicians discovered that the oil flow through the stern tube seal assembly was blocked because part of the assembly had been positioned 180 degrees the wrong way. After the flexible mobdock was

## No leaks in 13 years

Seawater lubricated propeller shaft bearings on the cruise ship *Grand Princess* have not leaked in 13 years, reports Thordon Bearings, the company that pioneered the technology.

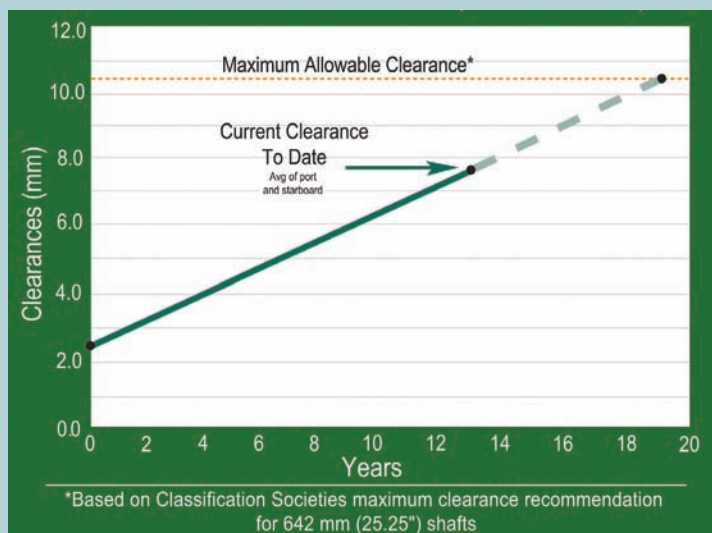
The bearings were fitted to the 109,000gt *Grand Princess* in May 1998, in a move to minimise dry-dockings. Due to its size, risk studies completed by the technical team at Princess Cruises/P&O, in conjunction with the shipbuilder, Fincantieri, indicated that few drydocks could take a vessel of this size. Any unscheduled dry-docking to repair a stern tube seal leaking oil could result in substantial financial losses, pollution risks and long transit to and from a suitably sized drydock. The recommendation: seawater lubricated propeller shaft bearings.

In the 13 years since, *Grand Princess* has not had any unscheduled drydockings due to stern tube oil leakage – there is no aft seal to leak and the bearings are lubricated with seawater, not oil.

In 2010 the ship completed a scheduled drydocking at Grand Bahamas Shipyard for extensive upgrades and modifications.

Bearing clearances in the original Thordon COMPAC strut and stern tube bearings were checked and indicated that the bearing wear was well within acceptable limits. The two propeller shafts have never been withdrawn

since their installation in 1998. In that time Carnival Corp has equipped 13 more of its ships with Thordon COMPAC propeller shaft bearings and more COMPAC bearing systems on order for two future newbuilds. **SW&S**



Thordon compac seawater lubricated propeller shaft bearing clearances (for *Grand Princess*)



installed, the assembly was opened and all parts were closely examined and cleaned. This inspection revealed that all seals were in good condition but that the bonding was faulty. The seals were rebonded and the seal assembly refitted correctly. The job was completed after four days, including full re-welding of the rope guard and shifting of the vessel to another berth.

In another instance, a diver/technician team performed a crack repair on the pintle area of the rudder of a 181m tanker and carried out a detailed inspection of the stern tube seal assembly of the vessel while it was berthed in Ghent, Belgium. Following this inspection the team replaced the worn seals and installed a spacer ring, thus creating a new running area for the seals.

Prior to the operation the vessel was trimmed as much as possible. The team then built a scaffolding around the rudder pintle and the stern tube seal assembly. Next they removed the rope guard and the damaged areas of the outer plating of the rudder. This allowed them to perform an inspection of the stern tube seal assembly and start the repairs to the rudder.

While the team prepared a first insert plate on shore, the inspection of the seal assembly revealed that the seals were worn and needed replacement. Next they installed the first insert and secured it while the second plate was prepared. Simultaneously other members of the team opened the stern tube seal assembly and it became clear that they needed to renew the running area of the seals as well. The team did this by installing a new spacer ring on the stern tube flange after which they replaced and bonded the three seals. All work was carried out under DNV requirements and verified by an attending surveyor.

Meanwhile, Hydrex was called out to Mobile, Alabama when oil was leaking from the stern tube seals of a general cargo vessel. The diver/technician team had to perform underwater stern tube seal repairs before the ship was transferred to a new chartering party.

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.



#### Dry underwater stern tube seal repair inside flexible mobdock

A team immediately left from the company's office in Clearwater, Florida, together with the needed equipment, and set up a diving station at the berthing location of the ship. After the flexible mobdock was installed around the stern tube seal assembly and a dry underwater environment was created, the damaged seals could be replaced.

When a 295m containership developed an oil leak from its stern tube seal assembly, caused by an entangled fishing net, a diver/technician team travelled to Panama. Three seals were replaced in one operation. Corrosion on the running area of the seals prevented the new stern tube seals from completely closing off the inside of the ship, so the decision was made to remove the spacer ring. This adjustment brought the seals beyond the corroded area.

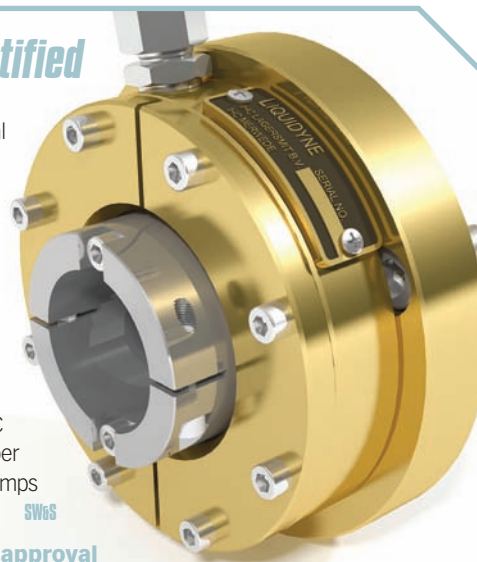
The company says that special lightweight equipment, together with a worldwide network of service stations, allows for an almost immediate mobilisation to the location of a vessel. This gives them the opportunity to have damaged seals replaced without having to change the sailing schedule of the vessel or to take it into drydock, saving time and money.

SW&S

#### Lagersmit shaft seal certified

IHC Lagersmit has gained ATEX 95 approval for its Liquidyne pump shaft seal, signifying compliance with the EU guidelines, which must be met in order for equipment to be used in potentially explosive atmospheres.

The Liquidyne pump shaft seal – types LDS, L2T and L3T – is cleared for use in zones one and two (potentially explosive gas atmospheres) and zones 21 and 22 (potentially explosive dust atmospheres). IHC Lagersmit now anticipates an increased number of applications of the seal for cooling water pumps in these types of environments.



SW&S

The Liquidyne shaft-seal has ATEX approval



[www.rustibus.com](http://www.rustibus.com)

THE BEST SOLUTIONS FOR  
SURFACE PREPARATION  
AT SEA.



Atex certified machines

\* Rustibus® is designed to de-scale and power brush ship decks, hatch covers, tank tops, etc. free from paint and rust.



**RUSTIBUS®**  
maintaining your values