

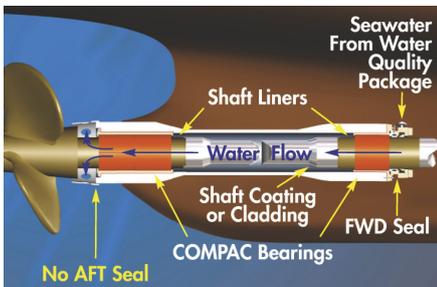
The global cruise industry is often at the leading edge of advances in technology. Cruise majors have been early adopters of cold ironing, for example, advanced coatings both underwater and on deck, and energy-saving initiatives such as advanced trim control.

Now the cruise industry is spearheading what must be the ultimate ‘environmentally acceptable lubricant’ – sea water. To be fair, sea water lubricated propeller shaft lines from Canada’s Thordon Bearing are not new.

In the cruise sector, the first systems were installed on board the Disney Magic and the Grand Princess in 1998 and, incidentally, are still working effectively today. Prior to that, Thordon bearings had been used extensively on board naval craft and coast guard vessels.

However, the introduction last December of new legislation in the US and Canada is hastening the pace of sea water lubrication take-up. Under the Environmental Protection Agency requirements, all ships trading in US waters must now use environmentally acceptable lubricants (EALs) in all ship/sea interfaces. These include stern tubes, thrusters, steering gear, propellers and hydraulic machinery.

The measures come in response to growing concern about lubeoil leakages which run into hundreds of millions of litres a year, according to some estimates. Ships both in port and at sea are prone to operational and accidental leaks.

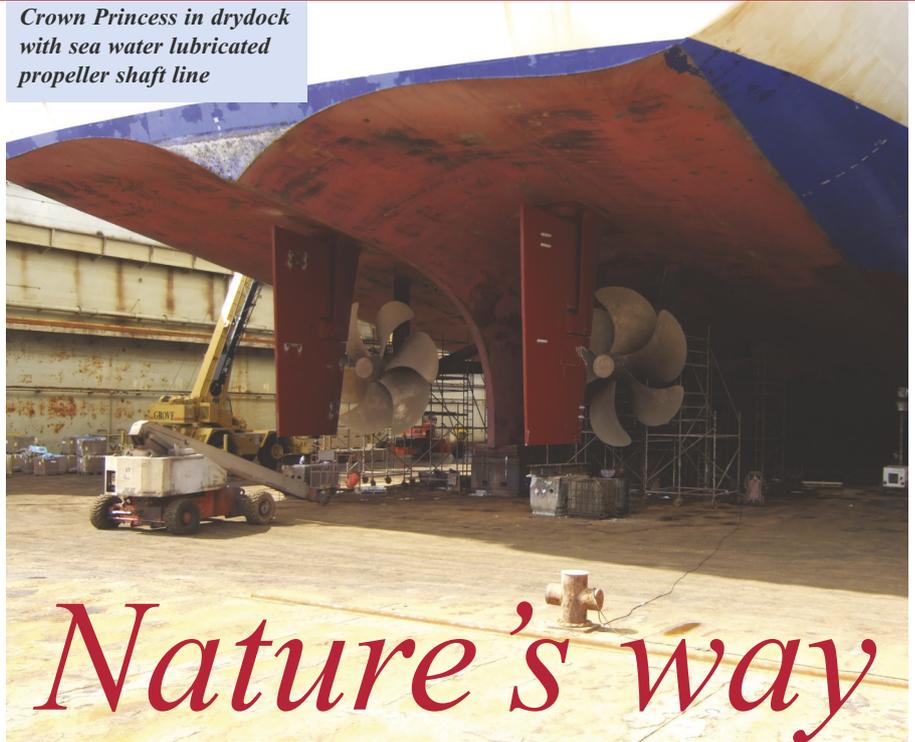


Components of a sea water lubricated propeller shaft bearing system

Thordon’s Craig Carter, director of marketing, says that leaky shaft seals are known to be a significant contributor to on-going pollution at sea. New regulations on lubeoils in ship/sea interfaces are likely to be drafted in other regions too.

Lubeoil manufacturers have scrambled to introduce a range of EALs. These must demonstrate that they meet strict requirements on biodegradation – the speed at which a lubricant breaks down – bioaccumulation – potential to enter the food chain – and non-toxicity. But EALs can cost up to ten times more than conventional

Crown Princess in drydock with sea water lubricated propeller shaft line



Nature's way

In shipping circles it's the cruise sector spearheading the most natural lubricant of all, writes Paul Bartlett.

lubeoils, according to Carter. And because they have been introduced in a hurry, no one really knows how long they will last.

Why not, then, use a lubricant that is free, widely available and occurs completely naturally?

Well, cruise ship owners are clearly voting with their feet. No fewer than ten of the 30 cruise ships currently on order are choosing sea water to lubricate the propeller shafts of their new ships. They include vessels currently being built for MSC Cruises, Regent Seven Seas and Viking Ocean Cruises.

Carter concedes that sea water bearings, based on advance polymer technology, do cost about 15-20% more than convention shaft seals at the outset but, he says, there are significant through-life savings. There is no aft seal, no lubricating oil, no storage of oil, no sampling, no disposal and no need to replace oil, typically required every five years or so. Moreover there are no costly seal repairs, which can cost between \$150-300,000 each time.

The company’s bearings outlast competing products by a significant margin, he says, contributing again to lower life-cycle costs and increased propulsion system reliability. Meanwhile, the electrically inert bearings resist sea water corrosion and provide outstanding abrasion resistance.

The family-owned company, based in Burlington, Canada, offers bearings in four different grades and multiple configurations to meet ships’ varying operating profiles. The bearings have approvals from all major class societies and Lloyd’s Register has new ‘Screwshaft Condition Monitoring’ notation for water-lubricated propeller shaft bearings allowing for no shaft withdrawal for 18 years from delivery provided that certain conditions are met.

So why has the take-up not been faster in the commercial shipping sector? Carter says that pace of take-up is quickening and about 600 commercial ships now use sea water as a propeller shaft lubricant. However, wider adoption of the technology in mainstream

shipping has not yet taken place, he believes, for two reasons.

The first is that shipyards are reluctant to adopt sea water lubrication because it means a change to their standard systems. ‘One of our tasks is to educate shipbuilders,’ he says. The other reason is the issue of higher first cost. Neither reason, however, stands up to close scrutiny, he says. ●



Viking – choosing sea water lubricating propeller shafts for newbuilds