

SEAWATER LUBRICATED PROPELLER SHAFT BEARINGS - AVOIDING PROBLEMS

THE ISSUES

A review of bearing failures in marine applications has revealed two major reasons associated with bearing failures. These two major reasons are **Marine Growth** and **Water Flow**. This document looks at both problems and presents the causes and possible solutions of the issue.

MARINE GROWTH

Marine growth on the shaft liner will prematurely wear a bearing. These deposits, including calcium carbonate deposits will disrupt the hydrodynamic film and create an abrasive environment for the bearing.



Typical marine growth on shaft



Material plating on the shaft liner

Preventative Measures

- Turn the shaft 2.5 revolutions every 2-3 days while alongside or at anchor to help reduce marine growth build up.
- Fresh water pumped into stern tube when the ship is idle will inhibit marine growth in the strut and stern tube bearings. A flow of 1x the water volume in the stern tube per day should be sufficient but can be adjusted for local environmental conditions.
- Active cathodic protection systems which are not operated properly and maintained can lead to material plating out on the shaft liner, leading to abrasive wear

WATER FLOW

Insufficient water supply or poor quality water can lead to bearing failure. Common design and installation mistakes include:

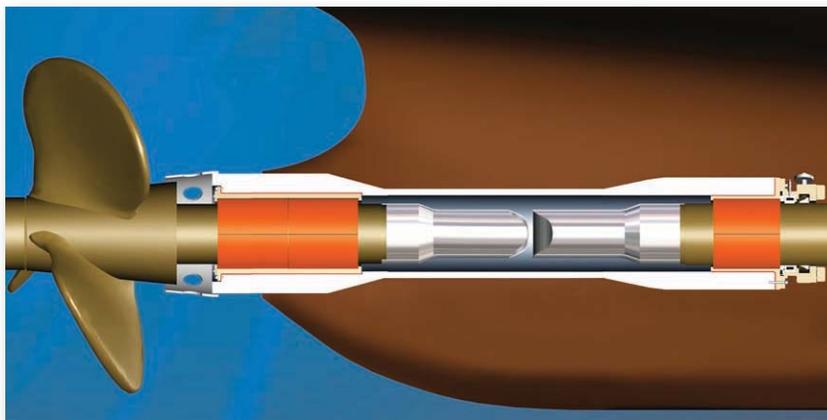
- Orifice plates placed in water supply line by others restricting the flow of water to the stern tube. In one application the seal manufacturer had placed an orifice plate in the water flow line because he felt there was too much water going to the stern tube.
- Bearing lubrication supply line valves are closed. After the bearing failure the valves

WATER FLOW (continued)

- should be re-opened.
- A single cooling water line feeding multiple systems and the stern tube supply is at the end of line. If other items divert the water supply, there may be insufficient water flow to the bearing. One solution is to place a flow meter (with alarm) to monitor flow under varying ship operational conditions.
- Corrosion in supply pipe. There have been occasions where a mild steel pipe was substituted for the normal Copper-Nickel piping. The steel pipe corroded on the pipe ID enough to restrict water flow to the stern tube.
- Sufficient opening between streaming cap (fairwater) and the propeller shaft to ensure adequate water flow to the bearing. As a general rule the opening between the shaft and streaming cap should be 20x the cross sectional area of the sum of all bearing grooves.

Note: Future marine growth will reduce this opening and should be kept to a minimum.

- Sufficient holes should be placed in the rope guard to prevent a blockage of water exiting the bearing. As a general rule, the area of the holes should be 20x cross sectional area of the sum of all bearing grooves.
- Flow meter with alarm should be used to indicate water flow to the bearings. You can have sufficient pressure or a pressure gauge but no water flow.
- Bearing cooling should be from a sole raw water cooling source and NOT post cooling. A common problem is when engine cooling water is used to lubricate the bearings.
- A dedicated pump should be used for bearing lubrication and not an engine driven pump.



COMPAC Seawater Lubricated Stern Tube Bearing System

For further information, please contact your local Thordon Distributor or Thordon Bearings.



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