

Intermediate bearing

SUBJECT VESSEL TYPE

Chemical Tanker

ISSUE

Failure of the intermediate shaft bearing

During a partially laden voyage a direct drive diesel powered Chemical Tanker suffered a severe failure of the intermediate shaft pedestal bearing. Significant wiping damage occurred to the bearing white metal surface requiring the ship to be towed to port for repair.

The vessel had recently completed a five yearly dry-dock survey during which the propulsion shafting had been dismantled for inspection. The inspection had revealed no problems and the shafting was refitted.

Following the failure bearing loads and shaft deflections were measured using the jack-up technique. The results revealed an unsatisfactory distribution of

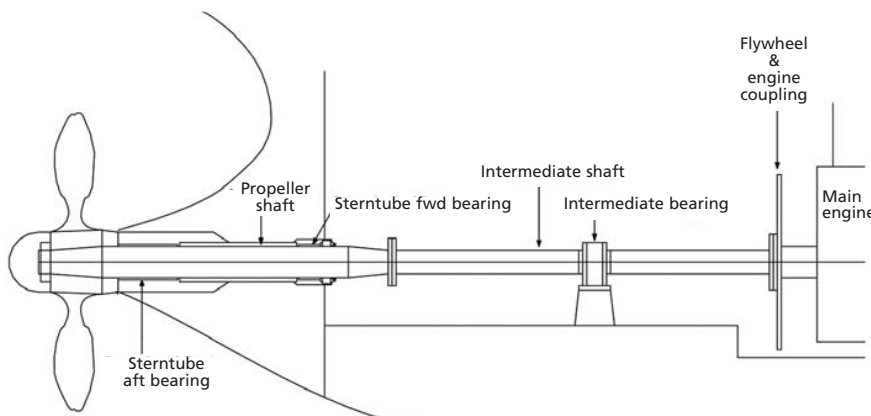


load along the shafting system length. In particular it was found that the forward sternbush and the second aft engine bearing had insufficient downwards load. The second aft engine main bearing was considered to be at risk of fatigue damage.

It was found by calculation that the satisfactory operation of the shafting system could be achieved even though the forward sternbush was only lightly loaded. This was supported by recent operating experience.

Calculations revealed that the scope for improvement of the alignment conditions by adjustment of the intermediate bearing was limited. Loading of the engine second aft main bearing by fitting an upwards offset bearing shell was therefore recommended. Such adjustment would improve the loading on the engine bearing but would have negligible effect at the forward sternbush.

Following the completion of the refitting a sea trial was carried out where the helm was held over for prolonged periods of time putting strain on the shafting system. During these turns, the aft sternbush and intermediate bearing temperatures remained stable. Also there was no abnormal vibration found during increases and decreases in shaft speed.



LESSON

Shafting systems require careful alignment, especially when the shaftlines are short and stiff. Appropriate combinations of measurements and analysis can enable correct alignment of the shafting components.