Benefit Case – Shaft Alignment Service

SITUATION AND CRITICAL ISSUE

150k LNG carrier – troubleshooting for damaged stern tube bearing

An overloaded stern tube bearing, due to poor design and/or inappropriate operation, caused operational off-hire and significant repair of the ship. The risk of propulsion loss was evident if no corrective actions had been taken.

DNV GL SOLUTION

▪ Assisting the ship owner in identifying the root cause of the bearing failure
▪ Assisting the repair yard in the proposal of a new bearing design, considering the effects of hydrodynamic propeller forces, hull deflections, shaft-line interactions with the hull, and bearings
▪ Following up on-site at the repair yard to ensure the best quality of the revised propulsion and a minimum of off-hire time
▪ Carrying out independent verification measurements

VALUE DELIVERED

▪ Contributed to balancing repair costs and off-hire losses by addressing actions that ensured the required level of reliability
▪ Minimized scope of repair to cover what is considered appropriate for a long-life operation of the ship (repair costs of approx. USD 3.5M)
▪ Minimized the number of off-hire days (rates at the time of off-hire: USD 60k/day)

For more information, please contact: Geir.Dahler@dnvgl.com
Benefit Case – Shaft Alignment Service

SITUATION AND CRITICAL ISSUE

Design assistance for shaft alignment on 110k Aframax tanker

Overloaded stern tube bearings, due to poor design, poor installation and/or inappropriate operation, caused operational off-hire and significant repair of the ship. The risk of propulsion loss was evident if no corrective actions had been taken.

DNV GL SOLUTION

▪ Performing independent shaft alignment calculations to ensure a robust installation
▪ Assisting the ship owner in reviewing the shipyard documentation and procedure before starting installation work on the newbuilding
▪ Attendance at the shipyard for supervision during critical steps of installation work, measurements etc., and continuous advisory for the ship owner throughout the process
▪ Carrying out independent verification measurements
▪ Performing reverse engineering studies to verify actual conditions

VALUE DELIVERED

▪ Performed independent, state-of-the-art calculations, incl. the proper sensitivity studies
▪ Provided supportive, competent back-up for the ship owner during negotiations with yard/maker
▪ Delivered on-site confidence, while asking the right questions
▪ Continuously analysed on-site measurements and advised on consequences for the safety of the alignment
▪ Delivered independent verification documentation

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SITUATION AND CRITICAL ISSUE

Newbuilding design support

Robust design of stern tube bearings to ensure safe operation (well distributed loads and lube-oil film) for normal straight ahead running and manoeuvring conditions.

DNV GL SOLUTION

- Performing shaft alignment and bearing load calculations
- Modelling for hull deflection (FEA)
- Modelling for shaft and stern tube contact (FEA)
- Carrying out propeller force analyses (CFD)
- Carrying out bearing lubrication and oil-film thickness analyses
- Providing on-site verification (advice and measurements)

VALUE DELIVERED

- Enabled shipyards and ship owners to utilize state-of-the-art technology for propulsion designs
- Helped shipyards and ship owners to include operational experience in propulsion designs
- Provided robust designs

For more information, please contact: Geir.Dahler@dnvgl.com