

Investigation for the Mechanism of Lateral-Torsional Coupled Vibration of the Propulsion Shaft in a Ship

Authors : Hyungsuk Han, Soohong Jeon, Chungwon Lee, YongHoon Kim

Abstract : When a rubber mount and flexible coupling are installed on the main engine, high torsional vibration can occur. The root cause of this high torsional vibration can be attributed to the lateral-torsional coupled vibration of the shaft system. Therefore, the lateral-torsional coupled vibration is investigated numerically after approximating the shaft system to a three-degrees-of-freedom Jeffcott rotor. To verify that the high torsional vibration is caused by the lateral-torsional coupled vibration, a test unit that can simulate this lateral-torsional coupled vibration occurring in the propulsion shaft is developed. Performing a vibration test with the test unit, it can be experimentally verified that the high torsional vibration occurring in the propulsion shaft of the particular ship was caused by the lateral-torsional coupled vibration.

Keywords : Jeffcott rotor, lateral-torsional coupled vibration, propulsion shaft, stability

Conference Title : ICASV 2019 : International Conference on Acoustics, Sound and Vibration

Conference Location : New York, United States

Conference Dates : October 08-09, 2019