

Water is one of the most significant destructive contaminations to lubricants which in turn lead to more power consumption and early damage to rotating machines. This study explores the effect of water contents in gearbox lube oil on the responses of electrical supply parameters. A two stage gearbox based mechanical transmission system driven by a sensorless variable speed drive (VSD) is utilised to investigate experimentally any measurable changes in these signals that can be correlated with water contamination levels. Results show that the supply parameters obtained from both external measurements and the VSD control data can be correlated to the contamination levels of oil with water and hence can be based on for an instant diagnosis of water contamination. Particularly, the voltage and hence the power responses are more sensitive to the water contents than that of current because the VSD regulates more the voltage to adapt the small load changes due to the water induced lubrication degradation. Simultaneously, vibration also shows changes which agree with that of power supply parameters.