

ABSTRAK

Wind turbine is an energy converter engine from wind into electrical energy. Since wind turbine requires optimal work, so care is highly required. One component that is often damaged is bearing. Damaged bearings will have an impact on decreasing the performance of the wind turbine. This study aims to detect bearing damage in wind turbines. Therefore, it requires early detection of damage to ball bearings in wind turbines using the methods of spectrum and envelope analyses.

This study uses bearing in normal and defect conditions on ball elements using vibration analysis with spectrum and envelope analyses. The calculation is carried out using a driving motor as a wind simulation with a shaft speed of 1200 RPM. The bearings used are Self Aligning Double Row, TAM Brand, and 1208K Series. The ball element is defective by using an EDM machine with a depth of 2 mm and a width of 0.7 mm.

The research findings indicate that envelope analysis has advantages in detecting bearing defects rather than spectrum analysis especially for bearing components that have relatively small impact or energy. Envelope analysis is able to generate the frequency amplitude of the defect bearing in the ball element that is closed or immersed in spectrum analysis. The ball produces a frequency with dominant amplitude in the area of 1xBSF, 2xBSF and 3xBSF in the defect bearing of ball element.

Keywords: wind turbines, damage to ball elements and, vibration signals