

ABSTRACT

Wind is a source of energy that is available in the nature with an unlimited number of which is one of the renewable energy sources and does not cause air pollution Harnessing wind energy can be made using wind turbines. Components in wind turbines often have damage, one of the components that often are damaged bearings. Pad one component that plays an important role in the process of a smooth rotation of the shaft. Damaged bearings will result in decreased performance of windmills. The purpose of this study was to detect the early stages of the lap pad is flawed beyond use vibration spectrum analysis method and developed the *envelope*.

This research uses the bearings with normal conditions and bearing that deliberately tampered with on the outer path (*outer race*) with a depth of 2 mm and a width of 0.7 mm. Detection of bearing damage is done using vibration spectrum and analysis of spectral *envelope*. Data retrieval is performed using motor mover in lieu of wind with a speed of 1200 RPM shaft. The bearings used are *Self Aligning Double Row*, brands of TAM, 1208K Series.

The results of the vibration spectrum plot, high amplitude of bearing defects beyond the path can not be seen, because it is still covered by the amplitude of noise so the damage has yet to be identified. While the spectrum *envelope* is able to eliminate the amplitude of frequencies that arise not from the bearing outer path, so the defect amplitude bearing defect path out looks more clear this is due to the method of analysis of *envelope* capable of bearing defect frequencies and separating natural frequency, and so on plot spectrum *envelope* only amplitude the height of bearing defects that appear.

Keywords : windmills, disabled path beyond bearing, analysis, and analysis of the spectrum *envelope*.