

FAULT ASSESSMENT OF GENERATOR BEARING FOR A 1.5 MW WIND TURBINE

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ABSTRACT

Bearing failure is the dominant cause of wind turbine generator failure. The purpose of this paper is to show the simple but useful analysis of generator bearings which could reduce the thousands of dollars cost of repair or maintenance by early indication of the fault, and scheduling the proper maintenance. Demodulation analysis on vibration data from the generator bearings of a 1.5 MW wind turbine is discussed. The frequency bands of interest were selected by the highest energy band calculated by wavelet packet transform. Results from the vibration analysis were consistent with a localized outer-race bearing fault. Results were then validated by cutting the bearing with water jet machine. A significant localized fault was found on the outer race.

Keywords: Condition monitoring; Demodulation; Envelope analysis; Generator bearing; Wind turbine; Outer race fault