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A PROJECT REPORT ON

Design anD Development of low Cost anD more EfficiEnt Magnetically levitated Wind turbines

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Design and Development of Low Cost and More Efficient Magnetically Levitated Wind Turbines

Abstract:

Nonconventional energy resources are the alternative forms of energy resources which can combat the deficiency of depleting sources of energy. Although there are various forms of nonconventional energy resources, the potential utilization of these resources is a major issue. In the present work efficient utilization of wind energy is considered. A novel maglev wind turbines are designed and developed to reduce the contact friction in bearings supporting the wind turbine shaft. Both vertical and horizontal configurations of wind turbines are designed and developed. Neodymium permanent magnets are used to support the wind turbine shaft both axially and radially depending upon the wind turbine configuration. Performance analysis of these maglev wind turbines is carried out to determine the startup wind velocity, rotational speed at various wind velocities, time taken to stop rotation and electric power generated at different wind velocities. Results shows that the resistance offered by maglev vertical and horizontal wind turbines is 35 % and 16 % less compared to conventional wind turbines respectively. Therefore higher rotor speeds in maglev wind turbines generated about 10 to 15 % more electric power at a recorded wind velocity of 6.7 m/s.

Keywords: Wind energy; maglev wind turbine; neodymium permanent magnet; vertical and horizontal configurations.