A braking system for the horizontal axis wind turbine using PID Control

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ABSTRACT

The problem experienced by the Wind Power Plant (PLTB) is the inconstant rate of wid turbines. To overcome these problems, a horizontal axis wind turbine braking control system was designed using PID control which aims to avoid wind turbine damage when there is an overvoltage. The braking system on this wind turbine is designed using PID control by trial and error method. The design and manufacture of a horizontal axis wind turbine braking system using PID control consists of literature studies, mechanical system design, electrical system design, and program design (software). The best PID value constants based on the tests that have been carried out are Kp = 2, Ki = 4.5, and Kd = 0.05 with the best system response parameters when the tool is installed from the beginning of the test having a Rise Time value of 23 seconds, Settling Time 45 seconds, Max Overshoot 0.17, and Steady State Error 2.6%. While the best response of the system when the tool is installed after exceeding the set point is obtained by the value of Rise Time 22 seconds, Settling Time 36 seconds, Max Overshoot 1.15, and Steady State Error 2.54%.

Key words: wind, braking, PID control.