

Abstract:

In this paper an adaptive fuzzy PI control is proposed to improve a frequency regulator in a wind turbine generator (WTG) supplying an isolated load at 50 Hz. The novel controller is applied through a flywheel system by balancing the system produced and consumed powers. That means, in case the WTG produces power higher than the isolated load demand then the frequency will be higher than set point. In this situation the flywheel is storing the excess power. On the other side, if the WTG power is less than the load demand, the frequency will decrease below the set point frequency. Hence, flywheel is compensating the needed power by the energy that was stored before. This hybrid renewable energy system is simulated by SIMPOWER in MATLAB SIMILINK software. Furthermore, performance improvement of the proposed new control is validated by the obtained satisfying results.