

ABSTRACT

In this paper a grid compliant variable-flux PM generator topology for wind turbine applications is proposed. An analytical comparative study of a series-double excited synchronous generator and an electrically excited synchronous generator (SG) is carried out with particular focus on the amount of MMF required to satisfy grid codes. A finite element based design optimization of the proposed generator is described in detail. The optimization process has been explored on the basis of dq steady state currents, rated torque, no-load voltage, variable-flux and minimum rotor-copper-mass. The results show amongst other things that a relatively low amount of rotor field winding copper is necessary for a variable-flux PMSG to be grid compliant.