A NOVEL APPROACH IN MODELING AND ANALYSIS OF VECTOR CONTROLLED SYMMETRICAL TWO-PHASE INDUCTION MACHINE FOR SMART GRID APPLICATIONS

RAGHVENDRAPRASAD DESHPANDE, G. K. PURUSHOTHAMA AND M. S. RAVIPRAKASHA

Department of Electrical and Electronics Engineering,
Malnad College of Engineering, Hassan - 573 202, Karnataka, India

Abstract

Many alternate energy sources are finding their application in the electric power sector to cope up with the rapid/fluctuating demand of electric energy. Co-ordinated use of power electronics along with sophisticated electric drives is becoming recent trend in the Renewable Energy Source (RES) connected systems. Integration of RES into the existing power grid in order to have more reliable and flexible system is expected to become one of the major components of Smart Grid. An unsymmetrical Two-phase Induction motor (TPIM) associated with the vector control strategy can be employed as a smart controlled Self Excited Induction Generator. In an unsymmetrical TPIM, vector control causes extra coupling between the stator windings. This leads to the complexities in the implementation of Field Oriented Controlled TPIMs. In this paper, a general model suitable for Indirect Rotor Field Oriented Control (IRFOC) for TPIM is presented. Simulations are carried out to establish IRFOC algorithm. The response of the drive for variations in torque and speed are obtained and reported.