A fast synchronously rotating reference frame-based voltage sag compensation system (Full Paper)

Abstract

A fast synchronously rotating reference frame (SRRF)-based voltage sag detection under practical grid voltages for voltage sag compensation systems is proposed in this paper. The proposed voltage sag detection is implemented on digital microprocessor as conventional synchronously rotating reference frames (SRRF) based voltage sag detection is lacking of an error component minimization (ECM) technique is rendered by synchronously rotating frame-based transformation in which sag voltage conditions and decoupled impedance (DI) technique is excluded the effect from harmonic voltages in practical grid voltages. Then new fast voltage sag detection for various practical grid voltage conditions is achieved. The proposed software simulation and experimental test results are made by investigating and verifying the operation of proposed voltage sag detection. The detection time of SRRF-based voltage sag detection is around one eighth of SRRF-based voltage sag detection in the case of only phase voltage sag and almost one fifth in the case of mixed phase voltage sag. This voltage sag detection can be used in any voltage sag compensation systems to improve their performances.

Author keywords

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References