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عنوان مقاله:

Damping of Unbalanced Voltage-Caused Vibrations of Induction Motors

محل انتشار:

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خلاصه مقاله:

Squirrel-cage induction motors adapt to a wide range of industrial applications due to their low cost, robustness and low maintenance. It is however expensive to record some damaged parts, especially when ignored incipient vibrations are the cause. Vibrations impede satisfactory operation; with direct proportion to poor power consumption, low efficiency and downtime. A comprehension of the trending works centers on constructional faults and mechanically tuned solutions to vibrations. One of the sources of induced vibration of induction motors is unbalanced voltages. This modulates the ideal characteristics of the motor speed, electromagnetic torque, voltages and stator current in terms of amplitude and frequency. A proactive damping of unbalanced voltage-induced vibrations are proposed in this paper. Hence, an implementation of a designed active power filter using MATLAB/Simulink software to damp the vibrations was carried out. Simulation results confirm the relational effects of unbalanced voltage on torque ripple. Amplitudes of power supply voltage under unbalanced condition are restored with p.u. values of ۰.۹۸ and ۱.۰۱. Hence, induction motor vibrations due to unbalanced voltage are minimised to tolerable levels.

کلمات کلیدی:

MATLAB/Simulink, Simulation, Squirrel-cage induction motor, Unbalanced voltage, Vibration

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