Electromechanical Transients of Series Connected Three Phase Slip Ring Induction Motors

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Abstract

Series connection represents a peculiar mode of operation of three-phase slip-ring induction motors. When the rotor is connected in series with the stator with opposite phase sequence, the motor can start and reach a speed close to synchronous speed. It has been also shown that motors under this mode can operate at double synchronous speed. The main objectives of this paper is to develop a mathematical model, along with a computer simulation, whereby the transient behaviour of the series connected induction motor can be analyzed, particularly during the starting period and synchronous speed operation. The torsional dynamic effects become serious when one of the torsional modes of the motor-shaft assembly resonates with one of the pulsating torque components of the overall electromagnetic torque. Therefore, the effect of torsional dynamics has been taken into consideration

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