AC TRACTION MOTOR CONDITION MONITORING

Condition monitoring of traction motors can be used to provide advance warning of many imminent failures which, if not detected, can be expensive and disruptive. The monitoring of rotating machines in service has not been seriously contemplated until now, but with an increase in the availability of cheap and portable computers and new spectral analysis techniques it is possible to monitor the health of induction motors in service. Also, condition-determined maintenance can be used to optimise the maintenance interval and hence minimise the whole-life cost of the equipment.

The method using harmonic analysis of the motor input current seems to be the most promising and is studied in detail. Work using 50 Hz sinewave supply indicates that the method is suitable for assessing rotor bar faults and eccentricity. A study of the inverter fed induction motors indicate that the method is suitable for rotor bar fault detection but may not be suitable for assessing eccentricity.

Different designs of inverters generate different harmonic frequencies and different motors generate different current harmonics when running with an eccentric rotor. For the diagnostic technique to work reliably for a given motor/inverter combination the two harmonic frequencies are kept apart. This can be achieved by a careful design of the inverter/induction motor system to avoid certain switching harmonics appearing in the inverter output current.

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