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Rotor Evaluation Using MCEMAX[®] - Part 2

Six independent methods of rotor evaluation can be used from the MCEMAX technology to analyze the condition of a squirrel cage AC induction motor: Pole-pass frequency (Fp) sidebands around line frequency, 5th harmonic, demodulated Fp frequency, Rotor Influence Check (RIC), In/Rush-Start/Up, and average inductance. Over the next six tips we will discuss each of these methods in detail and provide examples.

Part 2

The start-up of a motor is a stressful event. High current, rapid temperature rise and mechanical stress all create a perfect environment to evaluate the health of your rotor and expose any hidden anomalies. High resistance connections or broken rotor bars result in higher reflected impedance on to the stator windings. This higher impedance on the stator windings causes a drop in the start-up current and start-up torque, resulting in longer acceleration times for the motor. The initial in-rush or magnetization current should not change because that current is based only on the stator winding resistance until the rotor begins turning, but the start-up current directly following the peak in-rush will be affected. Additionally, the varying reflected impedance on the stator will result in a current modulation that is easily seen as a load fluctuation when using the In-Rush/Start-Up test as a process analysis tool during a steady state operation.

To see a case study showing the current modulation during a process analysis test visit our YouTube channel at:
<https://www.youtube.com/watch?v=pA7rXfNCqEk>

You are invited to submit an Electric Motor Testing Tip of your own and receive a free PdMA[®] mug or hat if we publish it! Contact Lou at 813-621-6463 ext. 166 or lou@pdma.com.