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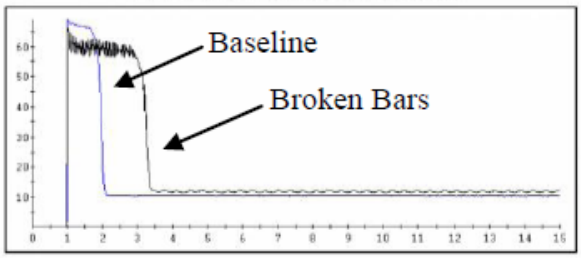
Tip Of The Week

August 8, 2011

Start-up Current Profile

A healthy motor exhibits the start-up current profile shown by the baseline curve in the figure below.*



As rotor bars break, the start-up current profile changes as less voltage is induced in the rotor cage due to the change in the effective turns ratio. This change in the ratio leaves a higher reflected impedance from the rotor to stator. Given a constant load and steady power during start-up, the higher reflected impedance lowers the amount of start-up current. Although the current is lower, the same total energy is needed to bring the motor up to speed. With less power from the rotor, the time required to put the same amount of energy (Joules) into the rotor has to increase. Thus, the motor takes longer to reach its final running speed (in this case approximately 3.5 seconds vs. 2 seconds). Additionally, the current at final running speed will be higher and may have oscillations as seen in the figure.

Reference: *Using a Six Fault Zone Approach for Predictive Maintenance on Motors*, by David L. McKinnon. (http://www.pdma.com/pdfs/Articles/Using_a_Six_Fault_Zone_Approach_for_Predictive_Maintenance_on_Motors.pdf)

*Note: If you cannot view the figure in this document it is Figure 15 in the referenced article.

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. 126 or lou@pdma.com.