



A Leader in Electric Motor Testing

# Tip Of The Week

June 29, 2015

## Rotor Analysis Techniques (Part 2 of 2)

Last week we discussed rotor analysis techniques (1 - 3) performed on motors that are de-energized. This week we will discuss rotor analysis techniques (4 – 6) performed on motors that are energized.

**Technique #4** is a quantitative evaluation of the amplitude of the pole-pass frequency sideband ( $F_P$ ) around line frequency ( $F_L$ ). This is an age old accepted approach where the analyst evaluates the difference in dB between the amplitude of the  $F_L$  and the amplitude of the  $F_P$ . Elevated  $F_P$  under a 40 db difference from the  $F_L$  should be monitored closely and trended.

**Technique #5** is a qualitative evaluation of the 5<sup>th</sup> harmonic of  $F_L$  looking for  $F_P$  sidebands created by the phase shift in the air gap flux surrounding a broken rotor bar. The presence of three harmonic  $F_P$  peaks to the left of the 5<sup>th</sup> harmonic in conjunction with technique #4 above, adds significant confidence to the assessment of a rotor bar anomaly.

**Technique #6** is a quantitative/qualitative evaluation of the  $F_P$  amplitude after filtering out the  $F_L$  and spectrum noise through a demodulation process. Although relatively new compared to the other evaluation methods, this technique is quickly becoming a favorite for trending rotor bar anomalies in larger two-pole motors.

To read more information about rotor analysis techniques visit our website at:

[http://www.pdma.com/pdfs/Articles/Fault\\_Zone\\_Analysis\\_-\\_Identifying\\_Motor\\_Defects\\_Using\\_the\\_Rotor\\_Fault\\_Zone.pdf](http://www.pdma.com/pdfs/Articles/Fault_Zone_Analysis_-_Identifying_Motor_Defects_Using_the_Rotor_Fault_Zone.pdf)

To read more information about the demodulation process mentioned in Technique #6 visit our website at:

[http://www.pdma.com/pdfs/Articles/Advanced\\_Spectral\\_Analysis.pdf](http://www.pdma.com/pdfs/Articles/Advanced_Spectral_Analysis.pdf)

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