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Understanding Spectral Analysis Peaks

Spectral analysis peaks are used extensively in Electrical Signature Analysis (ESA). As most people performing ESA know, the peaks represent energy at specific frequencies (such as 60 Hz). But, how does the amplitude of the peaks correspond to each other? Spectral analysis charts are a logarithmic ratio called the Signal to Noise Ratio (SNR) between a “signal” or dominant peak (such as the 60 Hz line frequency) and all the other peaks within a given frequency range (such as 0 – 480 Hz). On a spectral chart, the dominant peak is assigned a 0 decibel (0 dB) level and all other peaks will then be a logarithmic ratio of the dominant peak to the peak of interest (such as pole-pass sidebands). The decibel level of these peaks is correctly termed “decibels down” or dB down (from the peak). SNR is often used in audio equipment and is a representation of the dominant peak to the “hash” or noise floor when no other signals are present. The lower the noise floor, the higher the quality of the system (higher SNR) and the easier it is to hear low level signals. Relating this to motor testing, make sure you are maximizing the SNR of your test data by selecting the lowest applicable current probe range.

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.