

PeakVue™ – Early-Stage Bearing Fault Detection

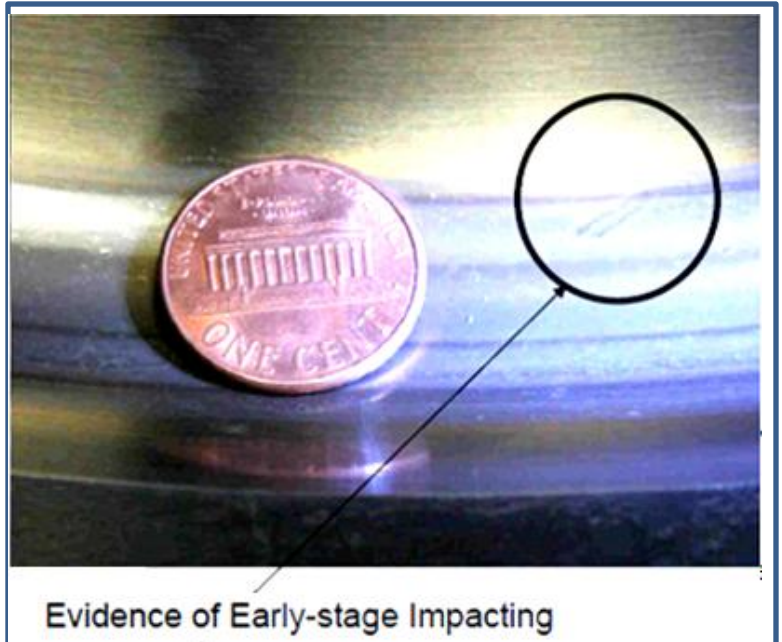
■ PeakVue™ is a patented measurement technique that is extremely useful for isolating high-frequency phenomena associated with developing faults, especially in gearboxes and rolling-element bearings.

■ The PeakVue™ algorithm isolates the peak energy of a waveform to provide early indications of developing bearing faults such as inner and outer race defects, ball defects, gear mesh, ***lubrication*** problems and any type of “impacting” fault, where metal is contacting metal .

■ With PeakVue high frequency faults will be visible, long before there is any significant increase in Overall Vibration.

■ PeakVue™ provides an indication of the maximum excursion in the waveform, which is how indications of many developing bearing faults are first manifested. ***Overall Vibration, on the other hand, provides an indication of the total low-frequency energy in the waveform.***

■ Based on years of experience with this technology, Emerson Process Management has developed alarm levels for PeakVue™, which are illustrated in the graph on the next page..



Example of Outer Race Bearing Fault Detected using “PeakVue™”

Overview

The premise for PeakVue™ is that the high-frequency components are not readily detected with more conventional measurements such as overall velocity, low-frequency energy (LFE), or digital overall. This is because the low-frequency measurements either average the energy or provide an energy summation over a relatively large frequency band and the relative amount of energy that is typically contributed by the high-frequency components is quite small.

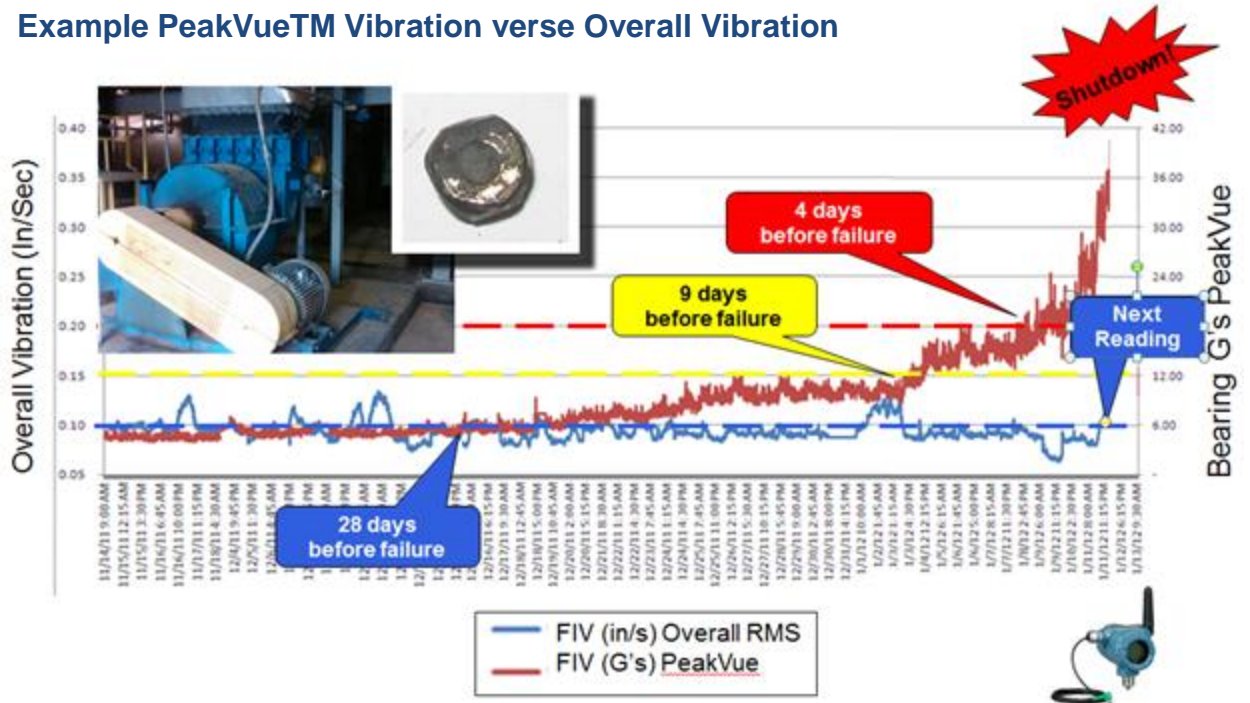
As a result, even large “spikes” are difficult to detect with classic techniques.

The difference in the vibration measurement for Overall Vibration versus PeakVue™ is depicted in a real world case in the illustration on the next page.

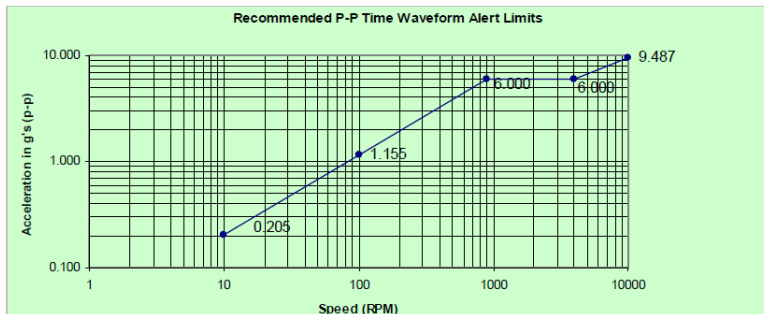
Suggested Plant Software:
AMS Suite: Intelligent Device Manager Ver. 10, AMS Suite: Machinery Health Manager and/or DeltaV Ver. 10

For more information contact your Novaspect Account Manager.

Example PeakVue™ Vibration verse Overall Vibration



PeakVue Alert Limit Information



The default PeakVue Alert levels in the CSI 9420 are:

Advise	6 G's pk
Maint	12 G's pk
Failed	18 G's pk

The equations that govern this curve are:

$$g's = \left(\frac{RPM}{900}\right)^{0.75} \times 6 \quad \text{for RPM} < 900$$

$$g's = 6, \quad \text{for } 900 < \text{RPM} \leq 4000,$$

$$g's = \left(\frac{RPM}{4000}\right)^{0.5} \times 6 \quad \text{for } 4000 < \text{RPM} \leq 10000,$$

$$g's = 10, \quad \text{for RPM} > 10000,$$

These are provided as a starting point and these values (for a 3600 RPM machine) are used as the default alert thresholds by the vibration transmitter. The alarm levels may be different for your application.