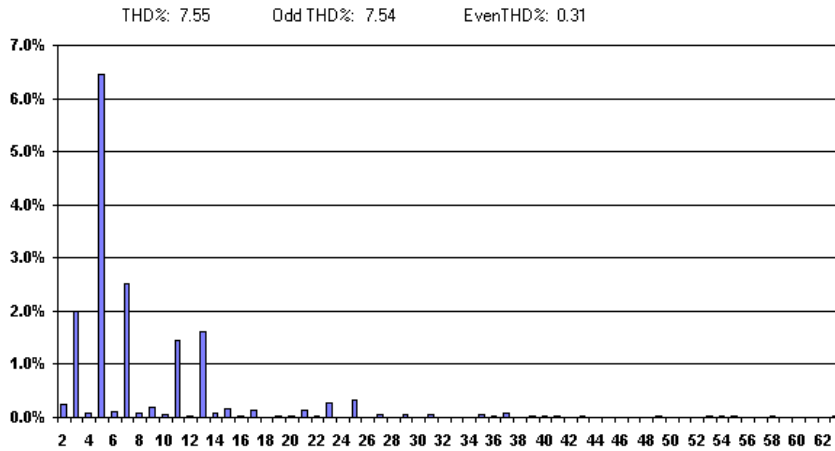




Most people who are familiar with power quality know that single phase, high crest factor loads can cause voltage flat topping. But what causes voltage "peaking"?



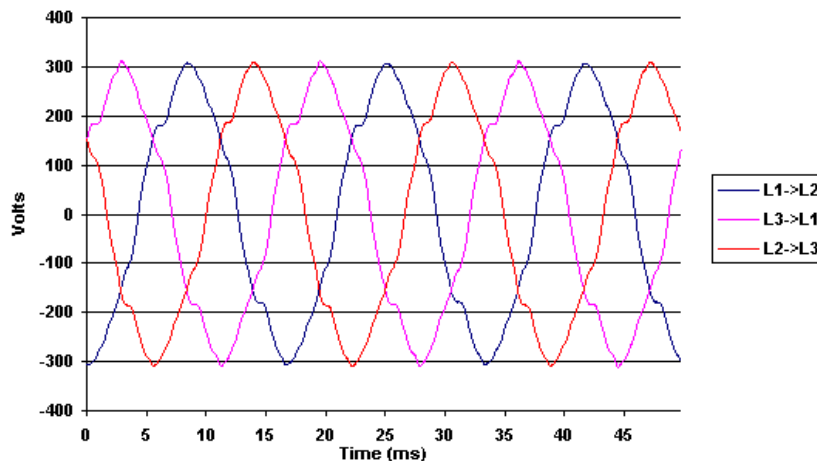
Initial Problem

Power supplies in a disk drive, located in a banking center, were failing excessively.

Initial power quality monitoring showed a high level of voltage harmonics (left). Normally, voltage harmonics of less than 5% are considered acceptable.

But high harmonics alone are usually not sufficient to cause component failures.

Waveform Snapshot



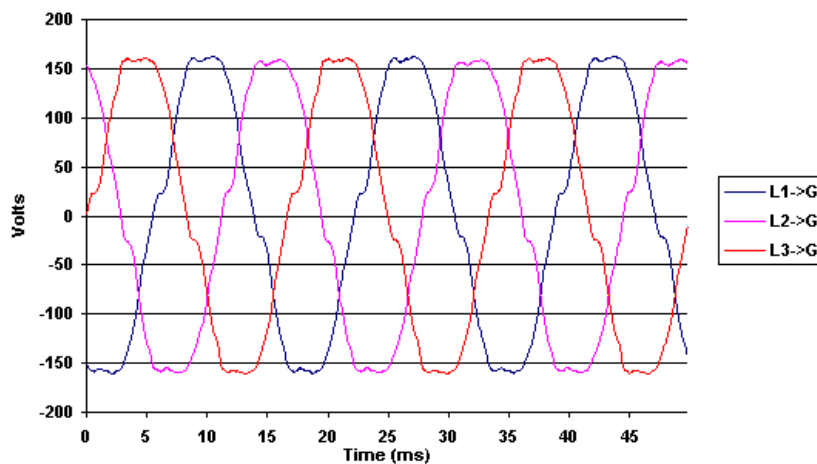
The Cause

The disk drive was fed from 3-phase, 208 VAC (Phase-Phase). The high voltage distortion was in fact voltage "peaking" with a peak voltage much higher than expected for a 208 Volt (rms) waveform.

This high voltage could be stressing the drive power supply, causing voltage stress or overheating.

But what causes voltage peaking?

Waveform Snapshot



The Culprit: Single-Phase Loads

Looking at the Phase-Ground voltages show the real culprit to be single phase, high crest factor, non-linear loads. Such loads cause a very characteristic flat-topped waveform, as seen here.

The single-phase loads cause this distortion, which shows up as voltage peaking on the Phase-Phase signals. Monitoring voltages from both Phase-Phase and Phase-Ground can be very diagnostic!