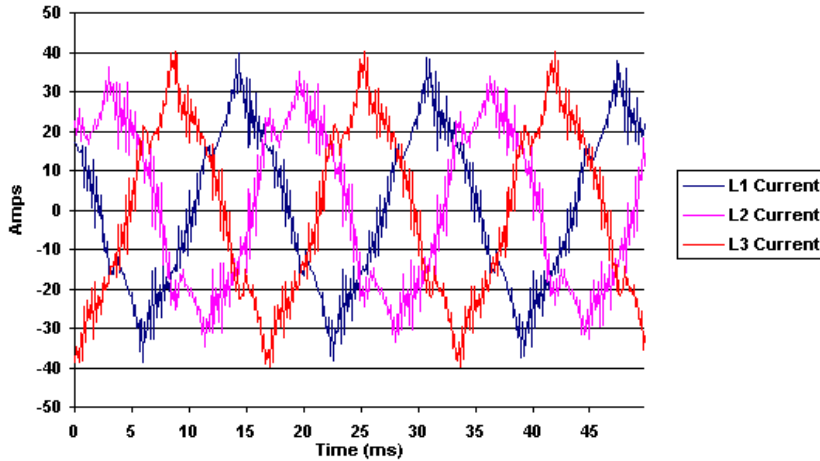




A large uninterruptible Power Supply (UPS) feeds a medical imaging system. Initial power monitoring uncovers a high frequency current on the output of the UPS, into the medical imaging system. Is this high frequency current real?

Waveform Snapshot

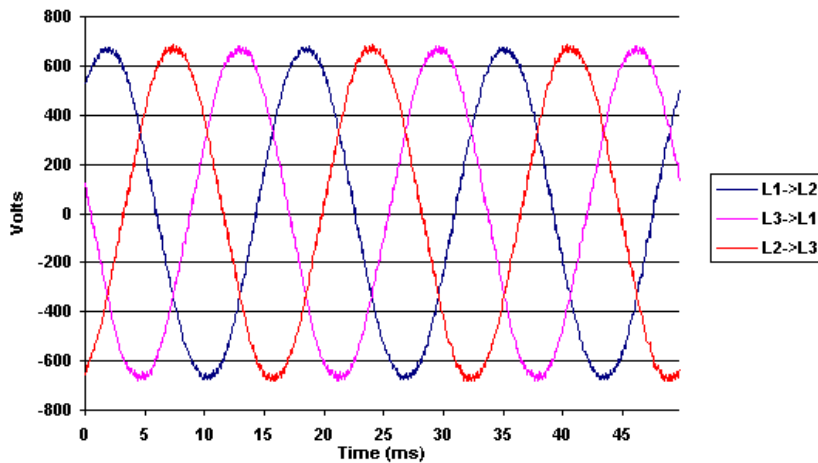


Initial Problem

A medical imaging system was being monitored for power quality. Input current snapshot shows three reasonably balanced phases of current – but with an unexpected and strange high frequency component that shows up on the current waveform as noise or “hash”

What’s causing this high frequency current?

Waveform Snapshot

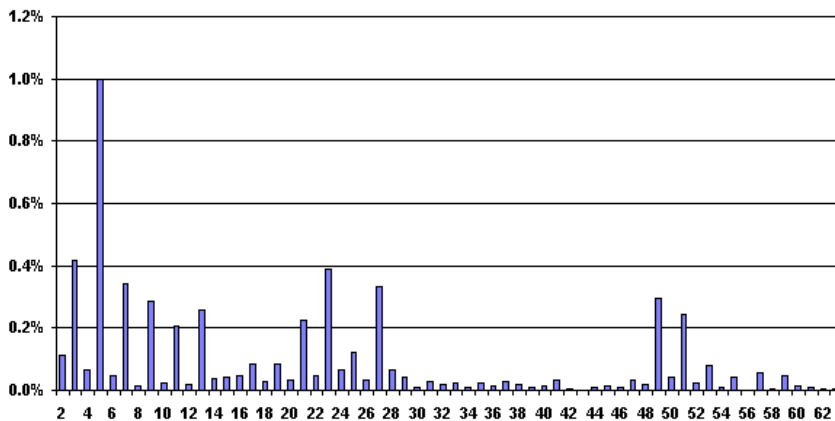


The Cause

The medical imaging system is being supplied from a large Uninterruptible Power Supply (UPS) that has a high frequency, PWM style output inverter. High frequency content on the output of this UPS can be seen in the voltage waveforms.

The power supplies contained within the medical imaging system include noise filters that are attempting to filter this high frequency content.

THD%: 1.43 Odd THD%: 1.41 EvenTHD%: 0.21



Supporting Information

Voltage harmonics show a pronounced spike in energy at the 49th and 51st harmonics. (3kHz, based on a 60 Hz fundamental) Subsequent conversations with the UPS manufacturer uncovered:

1. The UPS inverter PWM frequency was right around 3 kHz
2. The UPS did not have filters at this frequency.