



TEDDER'S TECHNICAL FACTS

Autumn 2006

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Technical
Services
(HTTS)
Offices

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LIC. #288-589 C-10

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Comm. A-17
LIC. #156612
Comm. A-11

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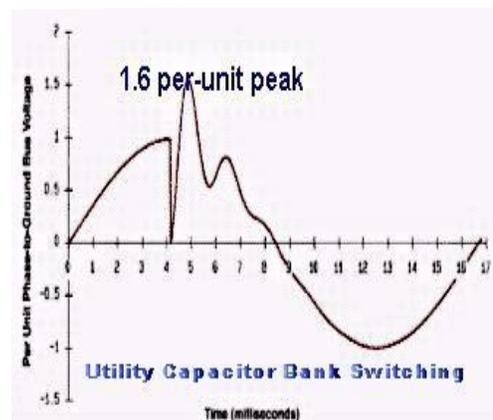
*Have Power Quality
Issues Stopped
Your Operation —
and You — Dead in
Your Tracks ??????*



Today's world has become deeply dependent upon the continuous availability of electricity. Intelligent technology demands power that is free of interruption or disturbance. As facilities and businesses become evermore dependent upon digital equipment, the quality of the electricity powering that equipment becomes evermore important. Especially sensitive to electricity quality are computers, servers, variable speed drives, and much telecom equipment. A power feed glitch of only an instant in duration can cause a system to malfunction, shut down or sustain damage that is expensive to repair, if it is repairable.

Exactly what are power quality problems? There certainly blackouts and poor utility customer service, which are power quality issues, but [our discussions in this article concern a power quality problem defined as any variation to the standard alternating current \(AC\) power sine wave](#); it can and does reduce power quality, whether it's amplitude, frequency or consistency, as well as variation in voltage level or cycle timing (frequency).

[A common first blame for power quality issues is laid at the serving utility's feet.](#) We hear things like "it's substation capacitor bank switching causing it" (see impact shown in the picture). Yes, we'd like to blame the utility, but in fact, most power quality problems experienced in buildings (maybe up to 80%) originate on the customer's side of the meter, not the utility's side.



Power quality problems in a building come from things like harmonics, voltage spikes and sags, transients, line noise, poor grounding, a low power factor, among others. These conditions can be generated by motors, variable frequency drives (VFD), switch-mode power supplies, the starting and stopping of equipment, electronic ballasts, among



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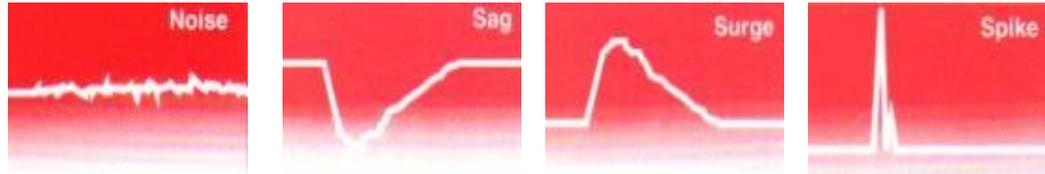
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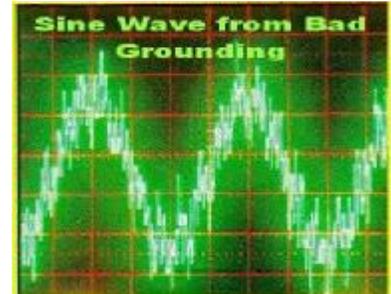
many other reasons. Here's are examples of noise, sags, surges, and spikes:



Realize that it's often harder to find and define a power quality problem and its source than it is to cure it. Many problems are like ghosts, appearing and disappearing without leaving a clear idea of what was just seen. Some only show up when several factors occur simultaneously. Others appear once and are never seen again.

Many "mystery" problems are assumed to be "bad power" and you just can't solve the issue. If this sounds like you, check your grounding system. **Statistically, 80% of power quality problems involve deficient or erroneous grounding.** In fact, proper grounding is even more important than surge protection to ensure reliable electronic function.

Ground is a logic reference for any electronic device, so the consequences of poor grounding can be significant. Any irregularity in the ground can directly affect performance of the logic at the chip level. In fact, a small change in ground can produce a large effect in equipment operation. The two top reasons for grounding are personnel safety first (of course) and asset protection second. However, a third reason is to assure top notch equipment performance. *We can help evaluate your grounding system, so give us a call!*



By following a well thought out systematic process when challenged with an electrical power quality issue, you will greatly enhance your effectiveness. Invest a little time up front doing your research and determining your plan of action. We can help by bringing you our expertise and along with it the benefit of our state-of-the-art testing equipment and we can together apply a combination of testing technologies.



We invite your discussion of any power quality issues that arise and we can contribute to an action plan that gets your electrical system happy again and back to trouble-free operation. You'll find our offices in the side bar and please visit our website too for more information about our capabilities.

www.hamptontedder.com