

The path to
energy efficiency
begins

with a
Power Quality
Audit

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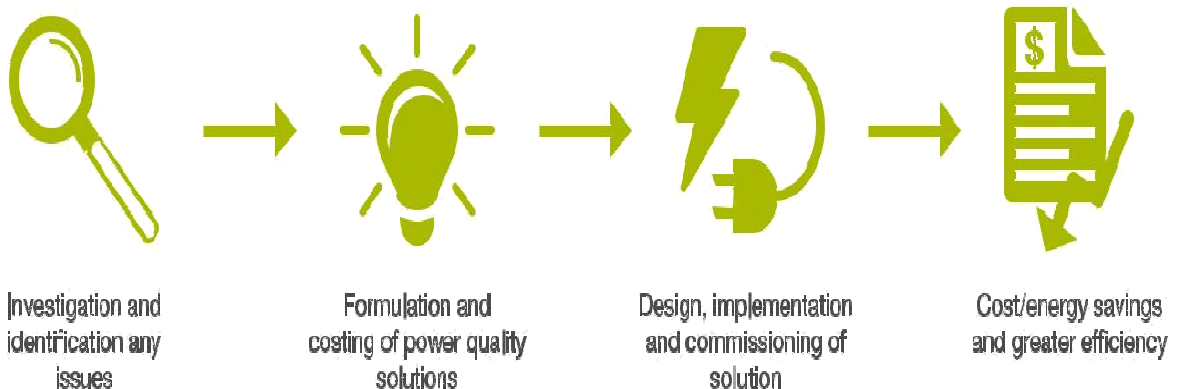
Power Quality Audits



Power quality has become increasingly important for industrial and commercial electric power customers, particularly as today's control processes rely on computerized equipment which is sensitive to power system interruptions and disturbances.

PJ&PJTaylor PL services audits can provide solutions to existing power quality problems, alleviate problems that may be looming in a power system, and provide recommendations to ensure optimal power quality.

Power quality problems can affect your productivity. As a manufacturer of converters/inverters for twenty years we have developed a wealth of in house experience, know-how, and technology to identify, solve, and oftentimes prevent problems. PJ&PJTaylor PL services, including site surveys, and equipment sensitivity assessments are invaluable tools for improving power system performance.



Common Power Quality issues

Through our work with all sorts of facilities, we've identified three significant types of power quality problems that can impact customer operations:

- **Voltage Sags and Momentary Interruptions.**

Increased sensitivity of power electronic equipment, coupled with the high likelihood of voltage sags and interruptions, has resulted in these being the most visible power quality events. Adjustable-speed drives, computers, office equipment, programmable controllers, and induction heating furnaces can be extremely sensitive to these events. Typically, sags occur when there are temporary faults on the utility power system, resulting in a reduction in the voltage level. Equipment sensitivity to these events is important because nuisance tripping of sensitive industrial loads can cause equipment downtime, reduce productivity, and hurt your bottom line.

- **Transients.**

AC and dc drives, along with other electronic loads, can be very sensitive to transient voltages. The tolerance levels of these devices are often less than other loads such as standard motors. A major concern for transient voltages occurs with possible magnification of utility capacitor switching transients at low-voltage capacitor locations on customer power systems.

- **Harmonics.**

Adjustable-speed and dc drives, along with switch-mode power supplies, cause harmonic currents due to their nonlinear characteristics. These harmonic currents can combine with system frequency response characteristics to cause harmonic voltage distortion. This distortion can cause control malfunction, capacitor failures, motor and transformer overheating, and increased system losses. These problems are compounded by the use of capacitor banks, which can cause resonance conditions magnifying the harmonic distortion levels. These banks are normally installed for power factor correction purposes, as well as to free up transformer capacity. IEEE's Std. 519 specifies strict current distortion limits that can prove difficult to comply with.

When we do facility power system studies, we look at a range of specific issues, such as:

- Harmonic analysis
- Transient analysis
- Utility capacitor switching activities
- Voltage and current asymmetry analysis
- Power factor
- Voltage sags and swells
- Electrical design

Identifying and Solving PQ Problems

PJ&PJTaylor PL services use a wide range of techniques and tools to find, study, and correct power quality problems. Monitoring and field measurements are a key element in the problem-solving process. We use a combination of fixed and portable monitoring instruments to detect and analyze disturbances on both the utility and your side of the meter, as well as at key process points and other locations. This monitoring helps us to locate where problems are occurring, and determine their potential cause(s) and solution(s).

Our goal is to prescribe a solution that is effective, cost-efficient, and won't cause problems for either you or the utility. We look at a wide range of corrective measures, including, to providing a range of cost-effective options for mitigation.

- Harmonic filters, passive and active
- Capacitors
- Surge arrestors or protectors
- Increased line insulation
- Power factor correction

What You Get with a Power Quality Audit

Preliminary review

Site personnel will characterize the problem, describe existing conditions that could be causing power quality problems, and help determine a plan for the site survey. This preliminary review helps determine the need for the site survey. Sometimes problems can be diagnosed at this stage, reducing the need for the survey.

Site survey & field measurements

When deemed necessary, an onsite survey is performed to gather specific information about the facility, power quality problems, and affected equipment. Using Power Analysers field measurements are made in conjunction with an onsite power system and equipment inspection. Measurements may include load current values, voltage and harmonic distortion levels, as well as transient voltage events.

Technical report

Following the site visit and field measurements, a technical report is issued. This report includes a summary of all of the information gathered, highlighted power system problems, a summary of field measurements, recommendations for eliminating the original problem. This report also includes base line measurements that can be used for future system design and facility planning.

Remote monitoring of utility assets

Synergy



We can offer design and install of remote monitoring of utility assets to keep track of:

- Harmonics
- Voltage
- Current
- Frequency
- Power factor
- Neutral currents
- Power sags
- Power noise

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