Technicon Approach to Energy Management

Power Quality & Management

Typical Power Issues facing Industrial & Commercial Users Today
- **Power Demand**
- **Power Quality**
- **Power Usage**
- **Power Factor**

How do we address each of these issues?

Power Demand
Objective - Reduce Power Demand & Eliminate or minimize utility demand charges

Solutions:

Soft Starters & Reduced Voltage Starters -
Minimize high in-rush currents during motor startup
Variable Frequency Drives (VFD's) -
Minimize high-in-rush currents by controlling motor Acceleration/Deceleration & RPM

Power Quality
Objective - Reduce inefficient & harmful harmonic currents by reducing THD
Harmonic currents can cause:
Poor power factor
Excessive power loss & Efficiency
Transformer & Distribution equipment overheating
Premature equipment failure
Sensitive equipment failure
Random Circuit breaker trips
Heavy fines from power company due to degradation of power quality

Solutions
Harmonic Filters & Guards
<u>**Active & Passive Harmonic Filters**</u>
Passive
Reduce harmonic frequencies (multiples of fundamental frequency)

Active (in addition to Passive filters)

Present near unity Power Factor to line Less than or equal to 5% THD

Reacts to changes in load within 50us

<u>**VFD's with active "front-end"**</u> - (in addition to inherent energy saving)

Present near unity Displacement Power Factor

Regenerate load power back into utility line

Monitor & protects motors and motor loads

Power Factor

Objective: Correct power factor to near unity (1.0)
Eliminate large surcharges from utilities

Solutions:

Power Factor Correction equipment
PFC Capacitors
Manual or Automatic Bank Monitoring & Switching
Manual - Manually installed capacitors
Correct Lagging Power Factor
Automatic
Automatic monitor & correct Power Factor by capacitor bank switching
Display current power factor & other data

Energy Savings
Objective: Lower overall power usage & monthly utility costs

Solutions:

Variable Frequency Drives (VFD's) - Control rotating loads

Typical types of loads
Variable Torque - Centrifugal pumps & fans
Savings exponentially proportional to reduction in (RPM)
Example: 10% reduction in RPM (Flow/CFM) = 25% reduction in energy usage
20% reduction in RPM (Flow/CFM) = 50% reduction in energy usage
Constant Torque - Positive Displacement Pumps - Conveyors
Savings directly proportional to speed reduction
Example: 10% reduction in RPM (Flow/FPM) = 10% reduction in energy usage
20% reduction in RPM (Flow/FPM) = 20% reduction in energy usage

Conclusion:

VFD's can address all of the above power related Issues

○ **Reduce Energy Usage**
○ **Reduce or Eliminate Energy Demand**
○ **Reduce Total Harmonic Distortion**
○ **Present Unity Power Factor (1.0) to power line**

Please allow us to discuss your specific power quality needs and visit our website: www.techniconiec.com