

The Basics of Power Problems: Causes, Effects and Costs

What is the Real Impact of Power Quality Problems?

The financial impact of power quality problems can be astronomical. It is estimated that "dirty power" and associated momentary disturbances in transmission can cost industry in lost production and equipment damage between \$3 billion and \$5 billion per year.¹ The real effects of system downtime, including lost data and business opportunities, can be immeasurable. According to a survey by the Business Communications Co., downtime costs are estimated between \$1,000 per hour and more than \$78,000 per hour. Some studies raise this estimate to \$500,000 per hour.

¹ Information Week, January 8, 1998

The Costly Effects of Power Problems in an Enterprise Environment

The effects of blackouts and other power problems in an enterprise environment can be devastating and costly. Using a Compaq UPS to protect servers and other critical equipment prevents unnecessary downtime, loss of data, and damage to your hardware. Maximum data integrity and system uptime require a prioritized shutdown plan which is managed by Compaq Power Management Software. Preserving data is an increasingly complex issue in today's enterprise environments. Communication systems are required to transfer and store information within internal computer networks and must also provide critical links to the enterprise-wide networks.

Questions & Answers

What Are the Causes and Effects of Power Problems?

1. **Healthy Electricity**
A typical sine wave form
2. **Noise and Transients**
High frequency impulses on sine wave
 - **Cause** - radio frequency on utility line
 - **Effects** - damage to logic circuitry and data files
3. **Spikes**
Extremely high voltage strikes to utility line
 - **Cause** - lightning, utility load switching
 - **Effects** - actual hardware damage, file corruption
4. **Fluctuation: Sags and Surges**
(Spikes lasting longer than one cycle.) Over and under voltage conditions
 - **Cause** - sudden startups of large loads, large load switching
 - **Effects** - slows disk drives intolerably, causing data errors; actual hardware damage
5. **Brownouts, Extended Sags**
Periods of low voltage on utility lines
 - **Cause** - voltage reduction by overburdened utilities, damage to electrical lines and other factors
 - **Effects** - causes intolerable voltage levels for circuitry and drive performance, damaging hardware or causing data errors

6. **Harmonic Distortion**

Distortions in the current and voltage sine wave sent back by variable speed motor equipment

- **Cause** - computers, fax equipment, copiers
- **Effects** - actual hardware damage, interrupted communications

7. **Blackouts Total Power Failures**

- **Cause** - violent weather, overburdened power grids, car accidents that bring down power lines, earthquakes, etc.
- **Effects** - hardware damage and data loss