

electrical disturbances

how to protect businesses



taking responsibility

At your business, the efficient use of energy brings benefits such as lower bills, improved comfort levels for your customers and employees and a reduced impact on the environment.

Acting together, our individual choices add up — for the benefit of our community, our environment and our energy future. That's the power of working together.

As your community energy company, we are committed to sharing our experience and energy expertise. You can always count on us for:

- Answers to your energy questions.
- Energy efficiency information and advice.
- Help in evaluating energy-saving options.
- Assistance in finding energy-efficient products.

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What causes electrical disturbances?

The major sources of electrical disturbances are:

- Wiring and grounding—inadequate or incorrect installation
- Motors—starting and stopping
- Laser printers and copiers—starting and operating
- Electric utility operations—switching or controlling faults and voltage levels
- Storms—lightning or wind damage











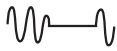
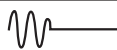

Lightning is a common cause of severe surges. Use Transient Voltage Surge Suppressors (TVSS) for all communications and electrical connections to the building. Additional TVSS equipment inside the building can protect electronic equipment.

How can electrical disturbances be minimized?

Improve the reliability of electronic equipment with these three steps:

- Utilize proper wiring and grounding practices. This solves most problems.
- Identify the electrical disturbance that is affecting equipment.
- Protect electronic equipment against the electrical disturbance. Refer to recommendations on page 2.

Match power protection to business needs

Power Quality Condition			Power-conditioning equipment			
			Transient voltage surge suppressor	Isolation transformer	Uninterruptible power supply	Standby generator
	Transient voltage surge	Line to ground				
		Line to line				
	Noise	Line to ground				
		Line to line				
	Notches					
	Voltage distortion					
	Sag					
	Swell					
	Undervoltage					
	Overvoltage					
	Momentary interruption					
	Long-term interruption					
	Frequency variations					
<div style="display: flex; align-items: flex-start; gap: 10px;"> <div style="width: 20px; height: 20px; background-color: #666666; margin-bottom: 5px;"></div> <p>The condition should be corrected by the indicated power-conditioning technology.</p> </div> <div style="display: flex; align-items: flex-start; gap: 10px;"> <div style="width: 20px; height: 20px; background-color: #cccccc; margin-bottom: 5px;"></div> <p>There is a significant variation in product performance. The condition may or may not be fully correctable by the technology.</p> </div>						

See chart definitions to right. 

Chart definitions for power-conditioning equipment

Transient voltage surge suppressor: limits or clamps circuit voltages. Devices vary by clamping voltage and energy-handling ability.

Isolation transformer: prevents voltage surges and electrical noise from interfering with electronic equipment. They have:

- physically separate primary and secondary windings.
- electrostatic shield to isolate their load from input source noise.

Uninterruptible power supply: provides regulated output power regardless of the condition of the input power source. Serves during outages ranging from a few seconds to several minutes.

Standby generator: supplies power during a power outage. They take about 10 seconds to come online and supply power for extended periods.

Develop an emergency plan for loss of power

Be prepared for the loss of electrical power due to failures, storms and accidents. Consider:

- Emergency light system
- Emergency fire pumps
- Emergency power system
- Equipment or system shutdown priorities

Justify the purchase of protection and backup equipment based on the cost of power loss.



Madison Metropolitan Sewerage District treats 40 million gallons of wastewater a day making system reliability critical. Mike Simon, Assistant Chief Engineer for the District, includes power quality equipment in the planning stages for new and rebuilt pumping systems.


listening. learning.

MGE takes responsibility to provide information and education to serve our customers and stakeholders. We educate customers today to help inform their decision making. We educate tomorrow's stakeholders so they can help plan our energy future.

Be prepared for the loss of electrical power. Invest in emergency light systems, backup systems and establish system shutdown priorities. *Working together we can make a difference.*

Call MGE and ask for a business account manager or visit our Web site for information about energy and more. We provide the technical, financial and educational services you need to stay competitive.

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