



Power Quality 101

For the Consumer

Reprints from Texas Coop Power Local Pages:

November 2003 - Don't Let a Flicker or a Blink Ruin Your Day

December 2003 – Outages: When the Lights Go Out

January 2004 – A Surge of Power...Worth an Ounce of Prevention

June 2004 – Surge Suppression – Your Tool To Stand Up to Power Surges

Don't let a flicker or a blink ruin your day..... Power Quality 101 for the consumer.

We at Mid South want to make sure you are getting the most of your energy instead of it getting the most or best of you. This article kicks off a series of articles that will appear in these local pages that will help you understand the energy partnership you have with Mid South Synergy.

"Electrical power is probably the most indispensable "raw material" used by businesses and residential consumers today. It is the ultimate "just in time" commodity because unlike most other goods and services we all purchase, it must be supplied in a continuous uninterrupted flow and cannot be effectively stockpiled or inspected for quality before it is delivered. The result is that, despite their critical impact, power quality problems are frequently undetected until after an incident occurs-interrupting processes and damaging equipment or household appliances causing cost losses to mount. Poor power quality can have an infinite amount of sources". *Power Quality Energy Consumer*, Power Measurement 2003

Today we are going to look at power quality, defining it and why it is so important to our everyday lives.

Just a few years ago our homes and offices contained very little in the way of high-tech electronic devices. As we have entered the 21st century we find many of these sophisticated devices controlling everything from our microwaves to our ovens and refrigerators to our home computers and home entertainment systems, which include TVs and stereos. With these sophisticated devices so common place, power quality becomes an increasingly important issue to every business and homeowner.

Power Quality defined: Refers to variations in the voltage of electricity flowing into and through your home or business. These fluctuations, which can range from a few volts to thousands, have the potential to damage your electronic equipment, either instantaneously or gradually.

When speaking of power quality, electrical disturbance is the best way to describe events that occur effecting power quality. Three most common types of disturbances are the following;

- Outages
- Blinks
- Surges

Today we will discuss and go into depth about Blinks.

- Blinks or voltage sags can be an inconvenience, but they rarely cause equipment damage. Blinks occur when an obstruction, like a tree limb, comes into contact with a power line or transformer. To minimize the possibility of damage to our system and your home and what is in it (i.e. electronic equipment) a circuit breaker called a recloser interrupts the circuit for a fraction of a second. If say for instance a tree limb remains on the line, the recloser opens (cuts power) a second time, and again tries to close (provides power). If the obstruction is still on the line after the third try, the breaker stays open (cuts power). At this point our Mid South Synergy dispatchers will dispatch a crew to examine the situation, remove the obstruction and manually reset the breaker. Over 300 breakers are installed throughout the Mid South system. System blinks actually means the electrical distribution system is working properly. Power blinks rarely damage electrical equipment in your home. Older digital clocks and other devices are the most vulnerable to blinks; newer models are designed to ride out small voltage fluctuations. When purchasing a new VCR or DVD, microwave or other electronic device with a digital clock, ask the salesperson or manufacturer if the equipment will withstand occasional power blinks.

Outages.....When the Lights go out..... Power Quality 101 for the consumer, part 2 in series

In last month's issue we kicked off part one of a series on power quality helping you better understand what power quality is and why it is so important to our everyday lives. In our first article we defined power quality and introduced to you the major disturbances that effect power quality. For review, the three most common types of disturbances are;

- Outages
- Blinks
- Surges

Last month we looked at blinks and how they are usually a common occurrence symbolizing the integrity of our facilities and an occurrence that does not usually harm modern electronics both in office and home. This month we are going to

look at the subject of outages and how Mid South has taken great strides to manage outages in an efficient and thorough manner.

- Outages are longer interruptions usually caused by severe weather and sometimes by equipment failure or a small animal interfering with a utility line. We occasionally must interrupt service for a construction project or maintenance upgrade. Many outages are limited to a few minutes, but if nature packs a punch, it might take several hours or even days to fully restore service. If an outage occurs, give us a call---with our state of the art PORCHE and SCADA dispatch center your call will be entered into our computer to help us determine the source, extent of the problem and the source of the problem allowing us to fix it faster by dispatching crews out into the field efficiently without hesitation. More on outage management later. When you do witness an outage it is a very good idea to shut off and unplug appliances around your home or office, because after the outage and when power is restored power surges can occur as service is restored. When your electricity comes back on, plug in appliances one by one.

Mid South cannot control external elements that affect our facilities day in and day out but when we do incur many outages, you can be assured that Mid South has one of the very best outage management and dispatch centers around. Between our qualified personnel and the software technology they use day in and day out, sound judgment in protocol is very important in working to get the lights back on for you. Below is a general guideline to help you understand how it all works together;

1. We protect public safety by clearing downed lines and making sure police, fire departments and hospitals have power.
2. Through our generation and transmission partner Brazos Electric, substations are repaired that take high-voltage power from the transmission lines and reduce the voltage for distribution to homes and businesses.
3. We repair distribution (feeder) lines that carry the electricity from substations to various neighborhoods.
4. We repair tap lines that can serve one home to over 100 homes.
5. We reconnect lines to individual customers—the most difficult and time consuming step.

Helping us manage outages is a state of the art dispatch center utilizing the latest in technology, below is a good description of how it all comes together.

Dispatch is manned 24 hours a day 7 days a week by one or more Dispatchers. During office hour's 13 Customer Service Representatives answer your calls and send information to the Dispatcher via a software program. This software

program has the capability to look at the calls received and predict the safety device that has isolated the problem. The information about the customers and a map of the area is displayed for the dispatcher. The program continues to monitor changes in the size of the outage to alert the dispatcher of changes in its prediction. This program can handle multiple outages, compile history of outages, and customers affected, most of this happens before you hang up the phone. The same program is used after office hours but with a limited number of people available to answer phones another program is used to take calls. The program can answer 30 phone lines at a time and ask each person to enter the phone number that appears on their account. The program then checks to see if you are part of a known outage to give you information or alerts the dispatcher of the new outage. To increase your chances of getting power back on even quicker, recently Mid South introduced a new product for your home called an RPM. It was featured in the September 03 issue local pages of this magazine. This device calls the outage in for you for instance if you were away from home on vacation or on a business trip. Your local Mid South office has brochures you can pick up to learn about RPM or you can call the Member Services Dept. at ext. 144 to learn more and find out how you can get one of these devices for your home or business.

Other areas Mid South has continually improved upon in curbing outage time is our increased right of way efforts, clearing hundreds of mile of brush and trees which lie within our easements. No matter where Mid South personnel are whether they are manning a keyboard of a computer or chainsaw cutting a fallen branch, we are committed to keeping outage times to a minimum.

A Surge of Power....worth an ounce of Prevention..... Power Quality 101 for the Consumer, part 3 in a series.

Last month we looked at having no power and how Mid South has prepared itself to manage these outage events. For this month we will look at power surges, what they are and some easy tips to help prevent and guard you against them.

- Power surges occur when the flow of electricity is interrupted, then started again, or when something sends electricity flowing back into the system. Surges usually last a very short time (1/100th to 1/1000th of a second) and can range from a few volts of excess electricity (i.e. turning on a hair dryer) to thousands (i.e. a lightning strike). Average homes

across America experience more than 2,000 power surges a year both large and small.

An external power surge is one that comes into your home from an outside source, usually from a utility, telephone or cable TV line. It has many natural causes, from Mother Nature in the form of lightning or swaying tree limbs or small animals interfere with power lines. Surges can also occur when the power comes back on after an outage.

More than half of all surges however come from the electrical devices inside your home. When motorized appliances (i.e. can openers, blenders, air conditioners, refrigerators) start up or shut off, they can create small surges. These undetectable voltage fluctuations occur dozens of times a day, as these appliances are part of everyday activities in your household. It's ironic that most appliances that cause internal power surges are not as susceptible to power surges as ones that do not. Anything containing a microprocessor is especially vulnerable—the tiny digital components are so sensitive that even a small ten-volt fluctuation of electricity can cause a malfunction. Microprocessors are found in many consumer items including TVs, cordless phones, computers, DVD players, microwave ovens---and in some large appliances like dishwashers, washing machines and refrigerators.

Large power surges won't melt parts or blow fuses, but they can damage equipment over time. They cause electronic rust that gradually degrades equipment circuitry and reduces the operating efficiency. You probably won't be aware that this is happening until a device begins performing poorly or fails prematurely.

Circuit breakers do not always protect your electronics and appliances from power surges because surges travel faster than circuit breakers can react. Circuit breakers also won't protect you from surges that travel through cable and telephone lines.

An ounce of prevention

Your first line of defense against power quality problems is prevention. Don't ignore obvious signs of power quality problems such as frequently blown fuses, tripped circuit breakers or lights that flicker when a large appliance such as an air conditioner turns on. If you experience any of these problems, it is a sign that something is wrong and may indicate a fire hazard. If you have an older home, inadequate wiring could be the cause. Electrical systems in homes and manufactured homes especially built before the 1970s weren't designed to handle large-capacity refrigerators, entertainment systems and computer

equipment. A licensed electrician can help you determine if your home's wiring is capable of meeting your family's needs.

If your home is newer, you might have a problem with an overloaded circuit. Look for two or more large appliances drawing power from the same circuit, especially in the kitchen, or a circuit handling many small devices such as a living room filled with entertainment and computer equipment. Ask your electrician to establish dedicated circuits for each large appliance, and to divide rooms with multiple devices into separate circuits.

The easiest way to avoid power surge problems is to unplug devices that are not in use. There is no need to leave toasters, hair dryers, power tools or other small appliances plugged in. If you rarely use the programming features of your microwave or VCR, consider leaving those devices unplugged, too. Next month we will look at further solutions to avoid power surge problems; whole house surge suppressors along with smaller suppressors for inside the house.

Surge Suppression.....your tool to stand up to power surges. Power Quality 101 for the consumer, part 4 in a series

This past January, part 3 in this series explained what power surges are, where they can come from and how you can prevent them. Points for review;

- Surges occur when the flow of electricity is interrupted, then starts again, or when something sends electricity flowing back into the system.
- Surges usually last a very short time (1/100th to 1/1000th of a second)
- External power surges are ones that come into your home from an outside source, usually from a utility- either electric, telephone or cable.
- More than half of all surges come from electrical devices inside your home undetected from motorized appliances such as air conditioners, can openers, when they start up or shut off.
- The easiest way to avoid power surge problems is to unplug devices that are not in use.

With larger appliances, more computer and electronic equipment becoming more ever present in today's homes, power quality and the ability to control it is becoming more important every day. We all know that we cannot always unplug devices that are not in use, because quite frankly we use a lot of stuff in our homes. For these devices that we cannot live without, a good investment towards whole house surge suppression should be considered.



When looking at whole house surge suppression, there are two basic parts to this system that consists of the following;

- A meter-based, or entrance device surge suppressor that is installed on your external electric meter by Mid South Synergy or at your circuit panel by our licensed electrician. This device works to prevent large, external surges from entering your home through the electrical utility line.
- Point of use, or “plug-in” surge suppressors are attached to individual electronics to guard against external surges. Some units can also protect against surges that travel through telephone and cable TV lines.

To fully protect your electronics and appliances, using both types of surge suppressors is a must and is highly recommended. Meter-based surge suppressors can't protect equipment from surges that originate within the home and those that travel through cable and phone lines. Point of use suppressors can't protect connected equipment against large, external surges like those caused by lightning. When used together, though, the meter-based unit and point of use suppressors greatly work towards protecting your valuable electronics and appliances from all types of surges.

As an added member service Mid South Synergy is pleased to offer Power Quality Plus advanced surge suppression that will be available starting this month through our member services department. We offer both meter based and point of service products for a whole house protection package. Below are lease and purchase pricing for Mid South members that can be easily added to your monthly bill.



SUR TES 240 R (hard wired entrance device) \$6.95/month*
***a one time install fee of \$25.00 is required with this product**



SUR TES Point of service surge suppression kit (plug in) \$90.00*

* SUR TES kit comes free with one year lease agreement for SUR TES 240 R entrance device.

While most large appliances can withstand low-level surges, any programmable appliance, such as some coffee makers, VCRs/DVDs and other electronic equipment should be connected to a surge suppressor. Also, remember that power surges can come into your home through other utility lines as well as electrical lines, so be sure to install surge suppressors on all incoming lines, including those for cable and satellite TV, telephone, fax and modem. As a guideline, the following equipment should be protected with a point of use surge suppressor

- Televisions
- DVD players
- VCRs
- Video game systems
- Stereo equipment
- Microwave ovens
- Cordless telephones and answering machines
- All computer and home office equipment
- Home security systems
- Cable and satellite TV boxes

And lastly, the best surge suppressor in the world won't work if your electrical system is not properly grounded. Grounding refers to a connection from an electrical circuit to the earth for the purpose of personal safety. A surge suppressor relies on the ground wire to direct a power surge into the earth. Without a ground wire, a surge will travel directly to your electronic equipment.

With Mid South you are getting our commitment to service as we offer this advanced surge suppression that meets and in some cases surpasses the

toughest industry standards- UL, CSA and CE. Store-bought "off the shelf" power strips and surge suppressors simply aren't powerful enough to protect today's home electronics from even minor power surges. Also, with a whole house surge suppression package from Mid South you will get a licensed install from our resident electrician and a warranty to go with it. So, remember that all surge protection is not created equal. Protect your American Dream with Power Quality Plus from Mid South Synergy.

For more information about the Power Quality Plus surge suppression products and services from Mid South Synergy, please contact us at 936.825.5100 or customerservices@midsouthsynergy.com.

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