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## Electrical PM By Mike Kornas

**Consider these two words: preventive maintenance.**

**What did you think of first?** Odds are quite good that it had to do with your facility's mechanical systems, and electrical didn't cross your mind. In most companies, not nearly enough attention is paid to the maintenance of electrical systems, which is unfortunate, because interruptions and failures can carry very costly consequences.

Lack of electrical preventive maintenance, or EPM, can lead to a variety of problems, among them failed equipment, production down time, fire risk, increased utility costs, and decreased equipment life expectancy. Many companies operate reactively, rather than preemptively, and substantial time and money is wasted. Original electrical drawings and later modifications are often poorly documented, and oftentimes information that does exist is not centrally managed. Few replacement parts are kept on hand, or can't be easily located, for when an inevitable failure occurs.

No matter what the industry is, all businesses depend on their electrical systems. Failures can be catastrophic, for some more than others, with losses that can reach into the hundreds of thousands of dollars. All facilities should perform EPM on a regular basis to protect their electrical assets. When following specific guidelines, a comprehensive program can often be developed by a knowledgeable facilities manager, or an electrical PM specialist like Omni can develop one for you. Once an effective program is in place, most EPM is straightforward and relatively inexpensive.

**To find out more about electrical PM programs and how Omni can help you safeguard your assets, call Omni at 908-412-7130.**



## OMNI TECH TALK: How Does LED Lighting Work?

**Light-emitting diode, or LED, lighting has been used for years in indicator lamps,** traffic signals, and holiday lighting, and they are increasingly being used as an efficient alternative for incandescent and compact fluorescent lighting (CFL). While many of us are familiar with the terminology, most have no idea how LEDs actually work.

### What is an LED, and how does it work?

A light-emitting diode is a semiconductor device that emits solid-state illumination. The semiconductor is made of a positively charged and negatively charged conductor material. The positive layer has "holes" created by adding impurities to the conductor material, and the negative layer has free electrons floating about. When the semiconductor is electrically charged, excited electrons flow into the positively-charged holes and emit light.

### LEDs as an energy efficient alternative

When LEDs first appeared commercially in 1962, they were expensive to produce and emitted very little light, thus limiting their use mostly to indicator lighting. Major advancements have been made over the years, allowing scientists to develop high-power LED bulbs that can be used as an energy efficient replacement for standard bulbs. According to the U.S. Department of Energy, LEDs use 75 percent less energy than traditional incandescent bulbs and last 25 times longer, and they have twice the lifespan of CFL bulbs. Though LEDs are still more costly than CFLs, prices have dropped drastically and are expected to continue to come down in price as technological breakthroughs continue to be made. In commercial and industrial applications, LEDs pay for themselves rapidly. Industry leaders expect that LED bulbs will replace CFLs as the preferred method of efficient lighting in the very near future.



## TECH TIDBIT: Isolated Grounding

**Isolated grounding is not to be confused with electrical grounding.** Isolated grounding eliminates the noise that may be present in electrical grounding, which is not acceptable for sensitive electronics. Many process vendors require an isolated ground for sensitive equipment, as well as an instrument reference point. Always verify the manufacturer's recommendations as to whether isolated ground is required. Often times clients only consider isolated grounding after problems occur.

## The OMNI Safety Corner

**Safety is our #1 priority.** As part of our continual commitment to training, compliance, and improvement, we updated our safety manual for Spring 2013.

Omni has participated in numerous OSHA VPP projects, and we are ISNetworld approved.



## FROM THE PANEL SHOP: Condensation and Oxidation By Craig Drabyk

When electrical and mechanical rooms are subject to high temperatures and humidity and/or cool temperatures in the winter, condensation can build up inside electrical panels and gear.

**Moisture can also enter panels through leaking roofs or water lines.** Periodically check inside control panels and gear for any signs of water, moisture, rust or oxidation to avoid problems with electrical equipment functionality. Identify the source of any water infiltration and make the necessary repairs as soon as possible. Oftentimes moisture, rust and oxidation are only discovered once there is a major problem.



## Helpful Hints About Variable Frequency Drives

**VFDs are used on just about every construction project, and there are a number of guidelines you should follow to avoid common VFD problems.** VFDs should be located within 100 feet of the motors they service. Never run power wiring and control wiring together as this can create induction problems. Verify the drive control wiring interface which can differ depending on the drive. If your drive has an across-the-line bypass, be sure to check rotation in both drive and bypass. Be sure to order your drive with permissive run relay or have it installed as a safety if you're using your drive for air handling units. If you have hand-off-auto control, you may wish to monitor the hand mode on the drive to the BMS system. Lastly, verify with the technician what options you have available and which ones best suit your particular needs when starting up your drive. Following these guidelines can help you avoid the vast majority of VFD problems that can hamper your project.