

GREEN FOR THE ENVIRONMENT AND GREEN FOR YOUR OMB POCKETBOOK!

Over the last several decades there have been spectacular breakthroughs in medical technologies. The sizzling pace of advance technology has driven many of those breakthroughs in medical electronics. Imaging, monitoring, data management, and instrumentation equipment has never been more capable. Unfortunately, medical electronics have also never been more susceptible to damage from transient surges and dirty power due to the extreme sensitivity of their integrated circuit boards and sophisticated power supplies. These electronics rely on clean power with very tight tolerances for voltage fluctuations. Millions of dollars are at risk hundreds of times a day. A minimal investment in quality protection and power filtering will greatly reduce the electrical operational maintenance costs (**approximately 30-50% expense reduction results**). This does not include down time, patient/referring physician relations and potential lost revenue. Case studies have proven that proper filtering combined with all-mode (i.e., L-N, L-G, N-G) protection will reduce maintenance costs while improving image quality. With the recent reductions in Medicare revenues for Imaging and other clinical test procedures, maximizing the efficiency and reliability of laboratory and Imaging equipment is no longer an option, it is a necessity.

IT & DIAGNOSTICS SYSTEMS RELIABILITY:

While hospitals, laboratories, clinics, doctor's offices, and other medical facilities may appear to be electrically benign environments they actually represent **the electronic equivalent of a war zone**. Elevators, air handlers, imaging equipment, and many other types of equipment in the facility all create large numbers of surges. In fact **medical equipment is impacted by literally millions of these transient surges during its operational life causing lock-ups, degradation, and excessive maintenance costs**. Not only are there higher than necessary medical equipment maintenance expenses but also the quality of patient care is reduced and landfills are over utilized due to premature equipment failure.

Equipment damage, lock-ups and degradation begin with dirty incoming power. In the recent technological advancements of wireless interfaces, transient pulses propagate the entire data distribution system causing contamination of data on wireless and wired systems. Filtering these unwanted disturbances will improve reliability and enhance performance. As hospitals and clinics become more dependent on their PACS, and other communication systems, power spikes distribute to adjacent systems and equipment causing corruption of information. All facilities rely on the efficient management of data capture and distribution. Wireless systems have become commonplace in today's Health Care environment. These systems are responsible to accurately transmitting data throughout the network. A requirement for clean, consistent power is the foundation for reliability and cost containment. IT experts are challenged with keeping their servers operational 24/7. Corruption of data, and mass data loss is occurring much more frequently due to the sensitivity of electronic processors. As maintenance budgets are cut, operators are tasked to do more with less. Our years of experience in the Diagnostic Imaging equipment maintenance field has validated the most cost-effective solution to insuring up-time and drastically reducing maintenance costs lie in the implementation of these specialized filters.

Surges also do more than destroy imaging, monitoring, data management, and instrumentation equipment: they degrade and/or ruin lighting controls, HVAC controls, chiller systems and elevator controls. The net result is that the elimination of transient induced wear and damage can result in significant maintenance savings for all types of medical facilities. Facility managers for hospitals, laboratories, clinics, and doctor's offices are finding themselves under constant pressure to reduce operating costs. The old adage "doing more with less" has become commonplace in the medical world. You need a comprehensive layered protection system covering all microprocessor-based equipment. A properly configured, comprehensive layered protection system covering all electrical and electronic equipment will quickly pay for itself and reduce your maintenance costs for years to come.

The need has never been greater because of reduced reimbursements and competition for improving the reliability of your medical electronic investments and in cutting your facility operating expenses. To accomplish this it is necessary to consider a Total Protection System utilizing a network of power filtering devices. The costs of operating your investment in the electrical and electronic facility equipment will be dramatically reduced over the life cycle of your investment. The value of using a quality & performance based power filter such as manufactured by Total Protection Solutions, is that it gives medical facilities a huge opportunity to reach their GREEN & SUSTAINABILITY goals.

FIELD CASE STUDY EXPERIENCES:

Florida Hospital, East Orlando:

Customer, Mr. John Elkins, Director of Facilities Management, recounts his experience:

"Being in business, it is important to obtain a quick payback on all investments. I estimate that our payback period is less than one year"

Harris County Hospital District:

Reduced electrical maintenance costs, *"we have virtually eliminated equipment downtime attributed to electronic failures. Our equipment (electronic) repair costs have dropped to near zero". TVSS is now a requirement for every new Imaging installation project. "Typical failures we presently experience are now primary only mechanical, generally induced by accident or abuse."*

MeritCare Health Systems, Fargo North Dakota:

James Durben, Director of Facilities Services Manager *"CT virtually eliminated service calls due to down time, parts usage, maintenance, downtime and patient relations have all greatly improved" X-ray equipment, Cardiac Cath. Lab, results again have been excellent, no problems since installation. Besides direct costs of the damage, in the past we lost one week of revenue, downtime, patient relations, upset doctors and management"*

DMS (Diagnostic Medical Systems):

National mobile MRI/CT provider experienced positive results of protecting their mobile fleet investment and installed multiple mobile MRI systems with Total Protection Solutions to provide enhanced clean power no matter what the electrical supply may bring to their coach.

THE SURGING DAMAGE:

So, why do good systems go bad? How can processors misread information, and why don't these systems last their designed life? Power quality and surge protection expert William Goldbach - a **Life Senior Member of the Institute of Electrical and Electronic Engineers (IEEE)**, has spent the past three decades as an **electrical engineer in the power quality field**, identifying the relationship between clean power and control systems performance — attempts to explain why systems falter. **"There is no rocket-science to this puzzle. Dirty power degrades and destroys electronics,"** he states. By installing quality enhanced filtering protection, all electronics' life will extend by approximately 50% as a result of running on clean power. Extending equipment life is directly related to the reduction of hazardous wastes in landfills. Items such as mercury lights, heavy metal circuit board electronics, which could contaminate the soil and eventually leak into our drinking water is substantially reduced. This sustainability benefit of prolonging the life of electronics will conserve natural resources protecting our environment and reduce pollution.

Goldbach explains that microprocessors read information through current pulses as binary code (0s and 1s). As equipment is turned on and off, voltage and current pulses, known as transients, are generated. These pulses of energy are distributed throughout every piece of equipment in the system. "Depending upon the size and frequency of these pulses," he says, "the results will vary. As microprocessors try to function, these transient pulses of energy can cause lock-ups or data can become lost or corrupted." He adds, "Larger pulses will cause catastrophic failure while smaller pulses degrade the life of these systems and controls." Indeed, over 80 percent of all damaging transients, are generated internally by power loads cycling. Less than 20 percent are generated externally by lightning or utility grid switching. **Traditional surge protection just isn't enough. It takes sophisticated enhanced filtering to protect the life and performance of today's electronics.** A quality surge protector mounted at the main electrical service entrance will lower the energy of a large, externally generated surge, but without enhanced transient filtering it will do very little to address the hundreds of surges generated internally daily. These events happen in every hospital, business and home every day. To properly guard electrical and electronic equipment, a staged approach must be implanted.

ABOUT THE AUTHOR:

CURE Medical Services (Diagnostic Imaging services):

Noted by Founder and Director of Operations, Richard McCrocklin

Specializing in service to MRI, CT, and PET/CT systems

To include multi-modality installations consults to Hospital and Clinical facilities for system integration

Expert damage analysis for State Farm Ins., medical claims Division

Formerly with Toshiba Medical (Diagnostic Imaging Division)