

Dirty Power is Killing Your Machines

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There's a demon living at your customers' premises. It's living in your showroom as well. Hiding inside the AC power outlets, it's waiting and ready to wreak havoc on the equipment your sales staff spent so much time and energy to get into your clients' sites. And it's also waiting to strike your salesroom at just the wrong time.

The culprit is the same in both locations — power line problems. These problems include power surges and drops, line noise, and spikes—all stuff coming out of your (or your client's) electrical outlet in search of mischief to cause in various and sundry pieces of equipment.

"But wait!", you say, "We have excellent surge protectors that we paid a lot for at Home Depot — \$35 each isn't chicken feed. And what about the uninterruptible power supplies we spent so much money on and sold to our customers. Don't they provide protection?"

And they would be No, a \$35 surge protector or a \$200 UPS isn't chicken feed or anything to scoff at. But, it's also not something to place a great deal of reliance on. They just aren't designed to provide the kinds and degree of protection needed for the kinds of MFPs and printers that you sell.

The reasons are twofold. First, neither of these devices is designed for the current draw of an MFP, even a desktop unit. A typical 30-PPM MFP can draw in the neighborhood of 11 amps while printing. That kind of power draw would fry pretty much most of the UPS units you will find at retail. They are fine for providing a controlled shut down of a desktop PC or server, that's what they were designed for, but when it comes to heavy-duty line conditioning they'd run away in horror if they could.

Bad is not good

We've all gotten used to just plugging something into an AC outlet, turning it on, and expecting it to work. That works well with Mr. Coffee, not so much with printers and MFPs.

The problem is that MFPs and printers are more sensitive to power fluctuations than you might think. And power companies these days aren't all that concerned with the quality of the stuff that comes out of the outlet. In their minds, you're lucky to get

electricity at all — never mind if it is over or under voltage or contains spikes and/or line noise, which pretty much all electric service has these days.

Dirty power is bad for a number of reasons. Firstly, it's usually not apparent. In the Lab, we use line monitors with data logging capabilities. We can tell if we've had a spike or voltage fluctuation, though the logger we used to use before the flood last year nuked it, didn't record instances of line noise. And line noise is very common just about anywhere. Having the ability to know the condition and quality of the power being used when a printer or MFP malfunction happens is invaluable. That's why we log a number of environmental factors including the quality of power and any events and/or artifacts that show up on the AC line when a problem occurs.

But while the quality of power provided by the electric utilities is far from perfect, a problem with the power is not always the fault of the power company. A lot of appliances put noise on the line, and if you have a sensitive electronic device attached to the same line, that line noise will affect it. While you may not think a 300 pound MFP would be sensitive to some noise, there are parts of the electronics in that hulking gorilla that are very much so.

The other problem with dirty power is that a lot of it can sneak past the switching power supplies used in most of today's electronic equipment. Back when the power supplies used really big transformers, an effect called hysteresis produced something akin to inertia in the transformer's ability to react. So often a spike or bit of line noise was smoothed out.

Today's switching power supplies are more efficient, and while most have some kind of filtering, spikes, over and under voltages and noise do sneak by. Sometimes the results are subtle — the machine jams or misfeeds because the power anomaly causes a timing error. Or you (or your customer) might see lower print quality or gibberish printed instead of the expected document. In rare cases, a voltage spike or over voltage can fry a controller. It doesn't happen often, but it does happen. Having power completely fail usually doesn't do too much damage—we've all had power outages and been able to reboot the machine when the power returns. Having a large under or over voltage with an immediate response can

(Continued on page 2)

sometime cause problems resulting from a surge or overvoltage occurring following the event. Having the voltage dip to 60 volts and immediately shoot up to 160 volts, even momentarily, can send an MFP or printer's power supply or controller to voltage heaven. Again, this isn't a common occurrence, but if it *does* happen to a customer, they aren't going to expect the utility company to come out and fix it.

And retail surge protectors do little, if anything about spikes or many line voltage fluctuations. They are great if lightning hits an electric line nearby. But they don't really condition power.

We do a lot of reliability studies in the Lab, and we want to do our best to know that a problem is because of a problem with the machine under test and not a result of degraded power quality. To address this in the past, we used power-filtering devices. These are made by several vendors and often are private labeled. The ones we used in the Lab until they were fried last year by sitting in several feet of water for the better part of a week (we were flooded) were the ESP Digital QC Power Filter from Electronic Systems Protection. These are line filters, not power conditioners. They protect against spikes and line noise and large power surges. They are an excellent value for the money, and we often visit a manufacturer's showroom and see every machine attached to one. If you aren't selling one of these with every machine you move, you're probably doing your customers a disservice.

Yes...But there's always a condition

Rather than replacing the filters in the reconstructed Lab, we're testing a new ESP product — the Next Gen PCS Power Conditioning System.

It's a bit more expensive than the ESP filter we used previously. But it's also a lot more capable, and should provide a better margin when you sell them to your customers.

As with the term "document management", "power conditioning" doesn't necessarily mean the same thing to everyone. Power conditioning a data center is far different than providing power conditioning for an MFP or enterprise-level printer.

To start with, the Next Gen PCS has all the features we liked about the ESP Digital QC Power Filter (which, incidentally, is still very much available). The Next Gen PCS adds to those with more control over the unit's performance, an LED Event Monitor, and greater protection against the amperage surge that usually happens when you first power up an MFP, printer, or other device that draws a lot of current. This is called inrush current, and it can be substantial.

You've probably experienced it for yourselves when you've hooked up an MFP rated at 15 amps to an outlet with 15-amp service and another current drawing device on the same circuit. Turn on the MFP, and pop goes the breaker!

We see this effect all the time when we're testing. In fact, one of our standard tests is using a clamp ammeter to measure the current draw at startup, idle, and when copying and printing. It's not uncommon for us to see a device that draws 6 or 7 amps when printing or copying draw 10 amps or more when first powered up.

The NextGen PCS reduces this inrush current in many cases (not all power conditioning devices do this effectively), and

inrush current is not very healthy for the electronics in any MFP or printer.

So, where does all of this leave us? And why should you care?

Well, one of the reasons we're making the switch in the Lab is that the new devices simply provide protection in more areas than the old ones did. Truth be told, if that was all the Next Gen PCS did, we'd probably stay with the Digital QC Power Filter.

What really hooked us is the data monitoring and unit programmability that the newer product offers. With an optional data interface kit (which you should definitely buy, especially if your techs are using the Next Gen PCS for diagnosing power problems), you can monitor the line condition in real-time and save the results to a file. You can see a log of every power event that happens, and examine the line voltage over time in a scrolling line graph. In effect, it offers many of the same features that we used to rely on a separate AC data logger for and even allows a tech (or customer) to print out a visual graph and reports.

The software that comes with the data interface kit also allows you to set the thresholds where the unit will kick in for under and over voltage conditions. You can even set it to e-mail when an alert condition occurs — "Hi Mom. There's a problem with the power here!"

Our usage in the Lab is pretty much a no brainer. But so is selling one of these to your customers any time a printer or MFP is going to be used in a mission-critical situation. When your tech goes out to troubleshoot a problem, one look at the Next Gen PCS's log will show if the problem is related to an electrical event. And even if it isn't, being able to show a customer that the unit you sold to them averted potential problems before they happened is probably worth more in goodwill than the margin on the sale.

In any case, reliability is the most important criteria when it comes to buying a new copier or printer. These devices are built for this type of environment. We've spoken to many dealers that had customers with reliability issues and in the end, the device turned out to be perfectly fine. The issue was a bad power source. The customer doesn't know any better. They equate the service call to your MFP not running right — not because of their power. This is the kind of thing that may come back to bite you when it's time to replace those leases and you might not ever know it or have mentioned the problem to your customer. The best thing you can do is to put these devices on your client's hardware. Either pass the cost along or eat it yourself if it's a big enough customer. You don't want people questioning the reliability of your portfolio because they work in an old building.

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