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Facts and Fictions about Lightning

The phrase “Power Quality” has become ubiquitous in many engineering circles to preclude anything else outside of lightning strikes. Now while it is painfully obvious that lightning is an outstanding display of sight and sound, there are a myriad of other facets of power quality.

Power Quality should be looked at as a cube that is comprised of grounding, lightning protection, surge protection, harmonic mitigation, UPS and Generators; to name the most prevalent arenas. There has yet to be a magic black box designed as the panacea, despite what the last sales person who stopped by your office indicated in his/her PowerPoint presentation.

I recently read a blog by Didier Mignardo and have included it verbatim below. I will add some concluding remarks following point 6.

Didier Mignardot in his blog noted the following:

Misconceptions abound when it comes to lightning. People have preconceived ideas about what lightning is, what it does, and how to protect against it. How much do you know? Find out and argue back against the lightning know-it-alls.

1) ***Lightning rods protect buildings from lightning.***

True. Lightning rods protect buildings from fires caused by lightning. They actually comprise a metal rod and a down-conductor. Perched atop of a building they divert the awesome current from a lightning strike to the ground.

2) ***Lightning rods protect my electrical devices.***

False. Lightning rods do not afford protection against surges in voltage caused by lightning. Because the electrical installation is connected to the same ground as the lightning rod, part of the current can actually flow back into it and destroy your devices. Only a surge protection device (SPD), such as a surge arrester, can protect your equipment.

3) ***I’ve got a multiway adapter plug with built-in surge protection. The devices I plug into it are therefore safe.***

Wrong. This kind of surge protection just cannot cope with the sheer power of surges caused by lightning strikes. For effective, comprehensive protection you need to install an SPD in your switchboard.

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4) ***Surge arresters are destroyed at each lightning strike.***

Wrong. Surge arresters automatically discharge surges from lightning strikes to ground. And they can do so time and time again. Their life expectancy is broadly similar to the service lives of other protection devices like circuit breakers and residual current devices (RCDs).

5) ***I should unplug my electrical devices during storms.***

No, you don't have to, even if lots of people still do. If you've got a SPD in your switchboard, you don't have to unplug anything during a storm.

6) ***If I install a surge protection device, I can be sure that my installation is safe from lightning-related surges.***

Not altogether. It all depends on how and where you install it. Even if you choose the right class of SPD, it will be useless if you don't install it properly. Installation should comply with some essential rules. One such rule is the length of the cable that connects the SPD in your switchboard to the mains network. The shorter the better.

The information presented by Mr. Mignardot is good fundamental advice with respect to lightning rods. We would of course expand on the SPD aspect in that yes connector lead length is crucial in installation procedures, however the equipment to be protected and the SPD technology best to utilize ranks just above the lead length of the connecting cables. Inefficient or inaccurate protection technology may provide little or no adequate protection even if installed with less than 15 cm of connecting wire.

Contact us at www.ecsintl.com for additional power quality resources.