

5 reasons – other than safety – to use arc-flash resistant switchgear



Arc-flash resistant switchgear costs 10-15 percent more than standard gear, and it's not required by the consensus standards that govern commercial electrical systems.

And yet, it's being installed at more and more data centers.

The main reason is safety, according to John Levins, North American Business Development Manager at ABB for Datacenters and Infrastructure. "When you're dealing with people's lives, it's just not the place to try to save a few dollars." But, according to Levins, here are five more reasons why arc-flash resistant switchgear is becoming commonplace:

1. Ease of maintenance

Low- and medium-voltage arc-flash resistant switchgear vastly reduces the possibility of a dangerous electrical arc through various design elements. In one, modular components are easily removed and depowered before being opened. That means the riskiest act – opening the door on a piece of charged equipment – never has to occur.

And if an arc does occur, other design elements safely vent the energy away from people and equipment, with damage confined to the switchgear's blast-hardened cabinet.

All of this means maintenance can legally be conducted without restrictive Category 3 or 4 Personal Protective Equipment, Levins says. Work goes faster with less chance of error.

2. Fewer and simpler systems

Traditional switchgear is generally paired with an active fault-protection system that monitors each asset and automatically shuts it down at the first sign of a threatening spike in current.

These systems add complexity and cost to an electrical project, and they require regular testing and maintenance.

But the protection from arc-resistant gear is passive. Its preventive design makes flash-detection systems unnecessary. "It's less to buy and less to worry about. You don't have to do anything to achieve the promised level of safety. It just sits there and works while you worry about other things," Levins says. "When adding in the price of active fault-protection to non-resistant designs, the cost is about even."

3. Faster incident recovery

Dangerous arc flash isn't as rare as you might think. A quick search on YouTube delivers an endless series of explosions caught on tape. One well-worn and aging estimate from NFPA and IEEE claims that more than 2,000 workers a year are injured by arc flash.

"For now, let's choose to not even talk about the impact on workers and their families," Levins says. "If you build your data center to code-minimum standards, you may have your electrical equipment all segregated in its own area, but with as little as five feet between pieces of equipment."

An arc flash in one non-resistant unit may take other nearby equipment out of service.

"Outages can cost thousands of dollars a minute," he notes. "Even if an incident doesn't result in a service disruption, you may not be meeting service level agreements for redundancy. You need to be able to repair that quickly."

Recovery for arc-resistant gear is typically faster, because it limits damage to the single unit where the fault occurred.

"Now assume somebody was present when it occurred," Levins says. "Without arc-flash resistant gear, an injury is very likely. OSHA is involved. Even if you could replace the gear in two weeks, you're not going to be allowed to do it for legal reasons."

4. Favorable insurance treatment

Many insurance underwriters will therefore provide incentives to upgrade to arc-resistant gear. It reduces risk, downtime and, in the case of litigation over a death or injury, it improves a company's defense.

"Arc-flash resistant gear is not rare or exotic," Levins says. "If it ever came to a lawsuit, lawyers on the other side will emphasize that safer equipment was readily available and you chose not to spend the small amount of money to buy it."

5. Increasingly recommended

Levins concedes that recovery costs and insurance savings are rarely considered during the design of electrical system installations and upgrades.

"The people making equipment decisions are working with a fixed capital budget and they have every incentive to build to code-minimum requirements," he says. "But if they're empowered to look at lifecycle costs, this decision becomes easy."

He emphasizes that traditional switchgear can be retrofitted with protective relays, such as ABB's REA system. So he's not trying to make the case that units should to be replaced before the end of their lifecycle.

But increasingly, consulting engineering firms are advising clients to use arc-flash resistant gear when putting in new equipment, Levins notes, and some are now asking customers to sign a waiver if the recommendation isn't taken.

"There's a simple reason for that," he says. "Arc-resistant designs make systems safer and better. And if you look at the totality of the costs, at the very least they're comparable in cost over their lifecycle."

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