Four Innovations in Critical Power Distribution

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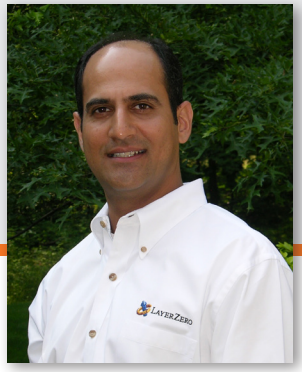

It is a truth universally acknowledged that foundation power distribution systems in mission-critical facilities must be Reliable, Information Centric, Safe, and Connected (RISC). With the passing of each year, the minimum functional and performance requirements along each of these dimensions get more and more stringent – yet the outlook is optimistic. Advances in technology and application are allowing critical facilities to eliminate the risk of downtime from the mundane to the most esoteric and unlikely scenarios. Zero downtime is starting to look feasible.

1. Reliability

From making quantum improvements in mainstream technologies, like electromechanical joint longevity, to the elimination of single points of failure in sophisticated control systems, some prescient manufacturers of power distribution equipment have achieved unparalleled levels of equipment reliability. Taken to the extreme, Triple Modular Redundant control systems have started showing up in critical distribution nodes like Static Transfer Switches – allowing highly critical distribution nodes to continue to meet their core mission even in the presence of a sub-system failure.

In addition, established solutions are now available for the formerly elusive concept of selective trip coordination in the most critical distribution segment of branch circuit protection.

Manufacturers are designing equipment with permanently brazed blind electrical joints to make them maintenance-free. Furthermore, advances in disc spring hardware have increased the longevity of bolted electrical connections by an order of magnitude.

2. Power Quality Monitoring

Electrons flowing in conductors have no memory, nor do they leave fingerprints behind. This cosmic deficiency has tormented operators of critical facilities. When there is an electrical anomaly, there is little forensic evidence left behind to analyze the event. The opportunity to learn from an event is lost, as is the ability to eliminate its root cause.

When an electrical problem occurs in a distribution node, its fingerprint needs to be and can be captured. The most effective means of doing this is to capture the waveform of the voltage and current flowing through the node at the instant the anomaly is detected, and syncing this information with the network

clock. Manufacturers of power distribution equipment are natively integrating waveform capture functionality into all devices; and facility operators are starting to adopt this feature with enthusiasm. When an anomaly is detected, it is now possible to capture voltage and current waveforms at the PDU inputs and outputs; at the RPP inputs; and most importantly, at each of the branch circuit breaker outputs.

In addition, distribution equipment manufacturers are now able to provide highly accurate metrics for capacity planning and energy conservation.

3. Safety

From the early days, critical facility operators have correctly placed the highest premium on human operator safety. In the United States, under the jurisdiction of the National Electric Code, and as defined by National Fire Protection Agency's Section 70E (NFPA 70E), protective clothing for operators (PPE) is specified when in the presence of energized conductors. Distribution equipment manufacturers are starting to make their equipment NFPA-70E friendly with innovative features like InSight Portholes for thermal scanning; and IP-20 finger-safe distribution panel boards. In many cases, there are distribution equipment solutions available that require no more than Category Zero personal protective equipment.

4. Connectivity

More is being demanded of fewer operators. In the presence of this trend, even the most information centric piece of equipment is rendered useless if it is not easy to connect the information to the facility's management database. Gone are the days of one-stop-shop equipment providers with proprietary connectivity platforms. Best in class is in – for all the right reasons. Open system connectivity has become the only way forward. The results are self-evident: operators are able to view, gather and process information to manage, forecast, and harden the reliability of their facilities.

About LayerZero Power Systems:

LayerZero Power Systems is the best-in-class provider of mission-critical power distribution equipment, and has developed technologies that greatly improve the safety of data center workers while providing unparalleled reliability. To learn more please visit www.LayerZero.com

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