DATA CENTER SUPPLEMENT

Providing lightning/static protection on data center facilities is in many ways similar to providing protection for any large industrial structure. However, there are several major differences that may cause problems or delays. This paper is to address several of them in hope of encouraging planning and communications to avoid unnecessary conflicts and delays.

By their nature, these structures may change well after design is complete and into the construction phase. Communications and early reaction to changes are key to preventing problems and delays. It is much easier to move lines of a piece of paper than to dig up a parking lot. The changes themselves and required engineering approval can easily cause preventable delays.

Changes during construction are inevitable. Just let us know as early as possible. We have in-house engineering and manufacturing which allow us to pivot almost instantaneously. If UL certification is required, we need to coordinate sooner rather than later with the UL inspectors to ascertain completion dates, access and prior removal of scaffolding and other temporary structures.

Grounding is a major issue. Most of the grounding initial design is done by the site project and electrical engineers to NFPA 70 (National Electrical Code) standards, that is, 60-hertz grounding. Unfortunately, lightning protection ground is very different. It is high frequency grounding to NFPA 780 and UL 96 standards. Lightning rated components and installation guidelines may be substantially different and apparently in conflict with NEC components and installation requirements. However, they must be made acceptable to UL standards for a successful installation certification. The different systems must be coordinated to meet both standards, and are best addressed and resolved by an experienced UL Certified Lightning Protection Installer backed by a competent engineering staff before conflicts develop.

Roofing can also be a source of turbulence. Cooling system designs can frequently change, and a freshly designed and installed lightning protection system may be rendered useless. Occasionally, an additional layer of roofing materials must be installed. If not planned for, this requires additional site mobilizations. Lightning protection installation techniques and adhesive types must be coordinated with the roofing contractor and material manufacturer to avoid voiding warranties. Any required sacrificial pads must be installed by the roofing contractor. Rooftop units (RTU's) must be located to determine the number and location of down conductors. Use of downspouts to hide down conductors must be coordinated.

Another area of concern is coordination between the trades. Access to roof areas, down conductors and grounding systems must be determined. Man-lift access, scaffolding, and other access requirements need to be addressed as they may change on a day-to-day basis.

Turn-key installations are relatively straight forward. However, if Lightning Master provides the components but the installation is performed by a third party, particularly one not certified by Underwriters Laboratories, problems can easily arise. That is one very good reason to have

Lightning Master at least supervise the installation. The initial design of the system is only as good as the quality and completeness of the drawings supplied to our engineering department. We have completed the protection systems design of so many of these facilities that we can occasionally do them from satellite photographs. However, it must be understood that the drawings we provide on this level will only show raw system design, layout, and material counts, not installation details. Those must be worked out as the project progresses. That is where experience and knowledge of the codes and standards become critical. Lightning Master principals serve on the standard writing committees and have a good, detailed knowledge of how to meet the requirements of the applicable codes and standards.

Lightning Master uses only UL Listed, industrial quality components, not residential or commercial quality components. We manufacture all components at our Clearwater, Florida factory. We regularly supply exotic materials compatible with industrial environments, and can easily do so with sufficient notice.

For both lightning and static control, we use "Fuzzy Ball"™ ultra-sharp point (USP) air terminals. In addition to being UL Listed air terminals, they have excellent static dissipating qualities well in excess of conventional lightning rods. Please reference our white paper on Evolution of Lightning Protection Technology.

Lightning Master is experienced in large, complicated projects. We can easily and quickly perform site visits, risk assessments, engineering designs, and custom manufacturing. Indeed, we have successfully completed so many of these projects that we have a comprehensive selection of custom parts to meet any installation requirements.

The bottom line in assuring a successful, on-time and on-budget project is communication. If we know what is planned and what is changing, we can usually assure a trouble-free project.

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