

Some Grounding Questions and Answers

What type of equipment is considered voltage-susceptible?

Computers, communication and switching equipment or any equipment incorporating semiconductors are extremely voltage-sensitive. Networked equipment, copiers, printers, as well as computer-controlled production equipment also are vulnerable to power problems.

If our facility meets the National Electric Code, is our equipment protected?

Not necessarily-the National Electric Code specifications provide only the minimal acceptable safeguard for personnel and property. A look at the National Electric Code language helps to relate the intent compared to your needs:

"CODE 90-1 Purpose...Section "C"

- Adequacy. This Code contains provisions considered necessary for safety. Compliance therewith and proper maintenance will result in an installation essentially free from hazard, but not necessarily efficient, convenient, or adequate for good service or future expansion of electrical use.
- Intention. This Code is not intended as a design specification nor instruction manual for untrained persons.

What are the symptoms of power quality problems?

The symptoms are varied, and what appears to be chronic hardware or software problems can be masked power/grounding problems. Common signs include:

- Increased service calls
- Poor equipment performance
- Partial equipment failure
- Equipment "ghost" problems
- Repetitive downtime
- Failures caused by building event
- Shortened equipment life
- Downtime and performance problems during/after bad weather and storms

What is the solution to power quality problems?"

The first step is to identify and quantify the problems through a system audit and evaluation. Because alterations to the Building Safety Protection System should address the specific problems documented during the evaluation process, the solution is as effective as the thoroughness of the system audit.

SPGS specified or reuses a "Five Point Approach" to solve power and grounding quality control issues, and to assure quality power in the future:

- Evaluate the building power and ground systems
- Report the findings with recommended corrective actions
- Make the alterations as requested
- Install passive monitors for continued quality control
- Maintain quality with a regular maintenance program

What is a Building Protection and Grounding System?

There are several types of Building Protection and Grounding System designs, but the purpose is the same: the system bonds and grounds all metallic objects and sensitive devices within, near, or connected to the building to the Building Protection and Grounding System via safety conductors. It is an inherent system intended to protect personnel and equipment within, near, or connected to a building against:

- Lightning surges
- Power surges
- Power faults
- Transient voltage
- Ground faults

What existing objects are included in a Building Protection and Grounding System Design?

Examples of interior objects that should be included in the design:

- Digital/Voltage Susceptible Equipment
- Metallic Conduit System
- Air Conditioning Systems
- AC Green Wire
- Metallic Doors or Window Casings
- Telephone Systems (Key or PABX)
- Sprinkler Systems
- Emergency Generator Chassis
- Building Steel

Exterior objects considered within the design include:

- Coaxial Cables
- AC Service Entrance
- Well Casings
- Metallic Fences
- Metallic Storage Tanks
- Lightning Protection Systems
- Antenna Systems

How does a Building Protection and Grounding System work?

There are a few basic concepts that you should know in order to understand the system:

- Buildings contain equipment designed to operate within designed voltage ranges.
- The Building Protection and Grounding System cannot control an event that causes voltage to rise or fall within the building.
- Transient voltage (in the form of current) will always seek and find all paths to its source: AC returns to its AC source; DC returns to its DC source.
- If a designed path is not available, all paths will be found to return the voltage to the source. Unfortunately, the "found" path usually routes through voltage sensitive equipment.

The Building Protection and Grounding System protects your equipment by directing that transient voltage through a designed path of safety conductors.

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