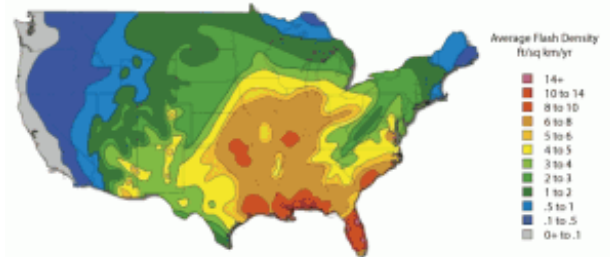


Protect Your Home

Evaluate your risk

Power or voltage surges are brief bursts of energy caused by a sudden change in the electrical conditions of a circuit. Wherever electrical or electronic equipment is used, power surges can and do occur. While often lasting only a millisecond, power surges can raise the voltage in electronic circuits from a few hundred to as much as several thousand volts. They are one of the most severe, common and immediate dangers to modern, sensitive electronic equipment.

The resulting damage can range from loss of expensive electronic equipment to structure fires that destroy an entire house.



What Causes Power Surges

Lightning

- Lightning can create strong electromagnetic fields, which can induce a power surge.
- Risk factors include your location and frequency of lightning and thunderstorms.
- See the map 1997-2007 Average U.S. Lightning Flash Density Map to determine your exposure to lightning flashes.
- Homes in areas subject to an average flash density of 10 to 14 fl/sq km/yr or greater have a severe exposure to lightning.

Local Power System Problems

- A common source for externally generated surges in home is the local electric company. Problems and points of failure include faulty wiring by a utility, equipment breakdowns, downed power lines, grid shifting (reallocating stored energy to match demand), and capacitor switching (a routine, daily event).
- Homes connected to power grids that may include industrial parks and manufacturing facilities have increased exposure to power surges.
- Large users connected to the same power line can also create power surges.
- Large electrical equipment that frequently turn on and off, such as high-powered motors, production equipment, heating/air conditioning equipment, etc., can create sudden, brief demands for power that can upset the steady voltage flow in the electrical system and result in power surges affecting everyone connected to the same power line.

- Externally generated surges may also be caused when two power lines come into contact with each other as a result of vehicle crashes damaging power poles, fallen tree limbs, ice storms or animals.

Reduce risk of damage from lightning and electrical surge

- For protection from lightning strikes in the general area of your home and externally produced surge, a whole-house surge protector is the best starting point for reducing the risk of damage or a fire.
- It is important to make sure that it is either a secondary surge arrestor tested to IEEE C62.11 or a transient voltage suppressor that has been tested to UL 1449, 2nd Edition.
- The protector should be installed in accordance with Article 280 or Article 285 of the National Electrical Code (as is applicable) and must have a working indicator light.
- A number of power companies have programs to provide and install the whole-building surge protection.
- If this is not available in your area, consult a licensed electrician.
- Protection should extend beyond the whole-building surge protection.

IBHS strongly recommends the following:

- Install additional protection for important or expensive electronic equipment.
- This should include localized surge protection for power cords to the electronic equipment and any telephone and cable/satellite TV lines connecting to the equipment.
- These devices are available at most home improvement and electronics stores.
- It is important for the home's electrical system to be properly grounded in accordance with Article 250 of the National Electrical Code. Also, all utilities (telephone, electrical, and cable or satellite TV) should be bonded to the same grounding point and preferably all enter your home within 10-feet of each other. This will ensure proper operation of the surge protection system and prevent ground potentials from developing between various elements of the electrical and communications systems.
- Have a licensed electrician determine whether your incoming line and disconnect box is properly grounded. If not, have them provide the proper grounding.
- Have them also review the power, telephone, electrical and cable/satellite TV connections to your building and improve the grounding if necessary.

Note: Whole house surge protection will not protect you from a direct strike on your house. For added protection from a direct strike, you would need to add receptors on the roof and cables that would help direct the strike away from the interior of your house. Homes in areas subject to an average flash density of 10 to 14 fl/sq km/yr or greater as defined in the Figure – “1997-2007 Average U.S. Lightning Flash Density Map” shown above have an increased exposure to lightning. Homeowners in these areas and those in other areas who are particularly concerned about a direct lightning strike should consider installing a lightning protection system.

Lightning protection systems are designed to protect a structure and provide a specified path to

harness and safely ground the super-charged current of the lightning bolt. The system neither attracts nor repels a strike, but receives the strike and routes it harmlessly into the earth, thus discharging the dangerous electrical event.

If a lightning protection systems is to be installed for the home, it should be designed and installed in accordance with:

- National Fire Protection Assoc. (NFPA) 780, Standard for the Installation of Lightning Protection Systems
- Underwriters' Laboratories, Inc. (UL) Standard 96A, Installation Requirements for Lightning Protection Systems
- Lightning Protection Institute (LPI) Standard 175, Standard of Practice for the Design – Installation – Inspection of Lightning Protection Systems
- All materials should comply in weight, size, and composition with the requirements of the UL 96 Materials Standards.
- All equipment should be UL listed and properly labeled.
- Equipment should be the manufacturer's latest approved design of construction to suit the application where it is to be used in accordance with accepted industry standards and with NFPA, LPI, & UL requirements.
- Standards and References for Lightning and Surge Protection
- Underwriters Laboratory 96A Standard For Safety-Installation Requirements for Lightning Protection Systems
- Underwriters Laboratory 452 Standard for Safety- Antenna Discharge Units
- Underwriters Laboratory 497A Standard for Safety-Secondary Protectors for Communication Circuits
- Underwriters Laboratory 498 Standard for Safety-Receptacle and Receptacle Plugs (Including Direct Plug-In Devices)
- Underwriters Laboratory 544 Standard for Safety-Medical and Dental Equipment
- Underwriters Laboratory 1283 Standard for Safety-Electromagnetic Interference Filters
- Underwriters Laboratory 1363 Standard for Safety-Temporary Power Taps (Power Strips)
- Underwriters Laboratory 1449 Standard for Safety-Transient Voltage Surge Suppressors
- National Fire Protection Association 70 National Electric Code
- Lightning Protection Institute (LPI) Standard 175, Standard of Practice for the Design – Installation – Inspection of Lightning Protection Systems
- Institute of Electrical and Electronic Engineers – C62 Collection of Guides and Standards for Surge Protection
- Institute of Electrical and Electronic Engineers – C62.41 Guide for Surge Voltages in Low Voltage AC Power Circuits
- Institute of Electrical and Electronic Engineers – C62.45 Guide on Surge Testing for Equipment Connected To Low Voltage AC Power Circuits

- Institute of Electrical and Electronic Engineers (std 1100) Emerald Book
- Institute of Electrical and Electronic Engineers Emerald Book (std 1100) FIPS 94
- Institute of Electrical and Electronic Engineers C62.41 Manufacturers (Allan Bradley, Motorola, other suppliers)
- National Electrical Manufacturers Association LS-1 Low Voltage Surge Protective Devices
- National Electrical Manufacturers Association LS-1

© 2012 Insurance Institute for Business & Home Safety