



Country Wide

Lightning surges naturally occur

*and can cause injury and/or
damage to your phone and equipment*



Damage and injury due to lightning

Lightning is a destructive force that can damage buildings, mains power services, telecommunication networks, equipment installed in your home – eg mains powered appliances, computers and telecommunications equipment - and cause injury to people.

For information on what lightning surges are and how they occur, see Appendix A

What can a surge do to you personally?

You may suffer an injury from using the phone or other electrical equipment during a thunderstorm as surges may strike at any time. In extreme cases this may be fatal. If you must use your phone during a thunderstorm because of an emergency, you may be able to reduce the risk of injury or death by:

- keeping the call as brief as possible;
- not touching electrical appliances, metal fixtures or brick or concrete walls; and
- not standing in bare feet on uncovered concrete floors.

Hands free and mobile phones may be safely used indoors but avoid touching the base station.

Equipment Damage

Your equipment may be damaged or malfunction, causing loss of service or data, due to surges which significantly increase the voltage on the power or telecommunication line above the rated voltage. In extreme cases surges may cause a fire in the premises. Your telecommunication equipment is particularly sensitive to damage from surges of an electrical nature due the complexity of the technology. The probability of damage is many times higher when telecommunication equipment is connected to both the telecommunication line and power line (fax machines, answering machines, computers, etc).

The sensitivity of the equipment to damage can vary widely from telephones, which are generally robust, to computer modems, which are generally fairly susceptible to damage.

What protection?

Protection may reduce the risk of loss, damage or injury from direct strikes (mainly rural areas) and against low energy surges (a much broader area).

Note: the installation of protection reduces, but does not eliminate, the risk of injury or damage.

Direct strike protection

Due to the fire risk associated with the high energy involved in direct strikes, direct strike protection, if provided, should ordinarily be fitted at the point of entry to the building of the service. This protection is designed to reduce the probability of dangerous surge currents entering the house wiring. This will reduce, but not eliminate, the risk of personal injury from fire and electric shock. It may not protect the equipment although it may reduce the level of damage.

Direct strike protection on the telecommunication line can be achieved by installing a gas discharge tube (GDT) in a box on the outside of a house, or in an MDF in a commercial building. To be effective this device must be earthed by connecting it to the building's power earth system by a short bonding wire. This protection can only be installed by the Network Operator (eg Telstra) or, in the case of customer owned cabling, a licensed Cabler. Please note that direct strike protection is not designed to protect equipment connected to the telecommunications line.

Direct strike protection on the power line can be achieved by installing a surge protective device (SPD) in the main electrical switch board, or for an out building in a sub board. This protection can only be installed by an electrician. Power mains SPDs will provide a high level of protection to appliances eg air conditioners.

Protection against low energy surges

For mains powered telecommunications equipment, a Multiservice Surge Protective Device (MSPD) is, in terms of suitability, cost and ease of installation, one of the best ways of reducing the risk of damage. This unit is a power board and contains both telecommunication and mains power protection. The customer can install this type of protection at the equipment. MSPDs can be purchased from most computer and electrical outlets and are of varying quality, effectiveness and cost. However, an MSPD may occasionally be damaged by a nearby or direct strike in any location (eg rural, urban etc), particularly if “direct strike protection” is not installed.

To provide the best protection possible, all interconnected equipment eg computer, modem and printer must be connected to the same MSPD. Where this is not possible, seek professional advice.

Installing an MSPD will not guarantee that the equipment will not be damaged. Equipment could still be damaged for a number of reasons eg:

- the equipment is particularly sensitive
- the MSPD is overstressed; or
- some interconnected equipment is not plugged into the MSPD.

Responsibility

Telstra’s policy is to install direct strike protection on services in lightning prone areas to reduce the risk of injury (as per Australian Standard AS 4262.1). Other than that, Telstra will install this protection at customer request and cost.

Power companies do not normally install SPDs at the customer’s premises as the service delivery point is

usually outside the premises. Therefore it is generally up to the building owner to organise for SPDs to be installed on the mains.

Due to the large variability in the susceptibility of equipment to damage it is up to you to decide whether to install equipment protection. Protection may be advisable if previous damage has occurred and/or the premises is in a rural or a high lightning area and/or contains expensive equipment and/or damage to any equipment could result in consequential losses, such as loss of data or income.

When should protection be installed?

Guidance on when to install direct strike protection on the telecommunication lines is given in Australian Standard AS 4262.1.

There is no similar standard providing advice on when to install SPDs on the mains. It would be reasonable to consider the installation of mains SPDs whenever direct strike protection is installed on the telecommunication line.

Guidance on when to install equipment protection is given in Australian Standard AS 4262.2. The table, below taken from AS 4262.2, provides a risk indicator for when equipment protection, eg an MSPD, is required.

RISK POINT VALUES FOR DEGREE OF RISK CRITERIA

Risk points	Resistivity $\Omega.m$	District type	Terrain	Thunder day level
1	1 – 10	CBD	Plains	< 20
2	11-100	Urban	Hills	20 – 40
3	101 1000	Rural	Mountains	> 40

Resistivity is related to the soil type and, roughly, 10 is river flat, deep dark soil; 100 is flat with clay soil; 300 is hilly or sandy soil and 1000 or greater is mountainous, rocky or dry sand areas. When in doubt a resistivity of 100 – 1000 $\Omega.m$ can be assumed. The appropriate thunder day level can be found at <http://www.bom.gov.au/climate/averages/climatology/thunder/thunder.shtml>

The risk points for each column are added. If the total risk is 8 or greater the equipment is at risk of being damaged. If the equipment cost was high, the equipment is important or there is a previous history of damage, it maybe worth installing protection regardless of the calculated risk.

For More information call:
13 2200 (residential)
13 2000 (business)

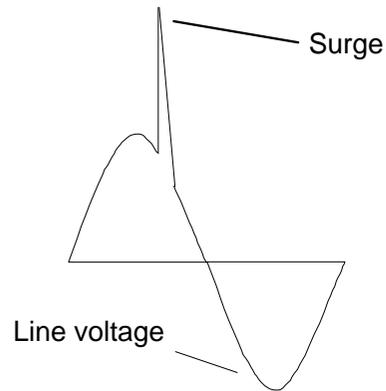
This brochure is provided for your information only. Telstra takes no responsibility for damage to your equipment nor for the poor performance of any protection system used. Customers must consult a specialist if in doubt.


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Appendix A – Surges

What is a surge?

A surge is a sudden increase in the voltage (or a spike) above the operating voltage of either the telecommunication system or the power system. This increase in voltage can be to hundreds or thousands of volts but will only last a few millionths of one second (less than a blink of an eye).



How do surges occur?

The main source of surges is lightning which naturally occurs, but they may also be caused by faults or switching on high voltage power systems, etc.

Surges due to lightning may affect either the telecommunication and power systems simultaneously or separately. Surges due to faults or switching on the power system may affect the power system only or may also induce surges onto telecommunication cables. One or more of the following mechanisms may cause lightning surges:

- a strike to the structure
- a strike to the telecommunication or power line
- a cloud to cloud strike or a strike to ground in the vicinity of the cable or the house

Generally lightning needs to directly strike the structure, or the power or telecommunication line to cause injury to a person. However sensitive electronic equipment, eg a computer modem or fax, can also be damaged by

- strikes to ground up to a kilometre from the line.
- a lightning strike to ground near the premises which can induce an overvoltage into the internal wiring of the premises.

Lightning strikes, on telecommunication or high voltage power line can cause damage or interruption to both telecommunication and power services to your premises.