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There are a number of sources which can cause electrical surges to be conducted or induced into the electronic installations network. Some of these may be attributed to equipment malfunctions, the power distribution network, static electricity and thunderstorm and lightning activity. The signal and low voltage network of electronic systems is vulnerable to electrical surges, including transients caused by thunderstorm activity. Electrical surges in these network as a result of thunderstorm and lightning activity can attain high voltages which may endanger human life and damage electronic circuits of associated equipment.

When lightning discharge occurs near buildings with electronic installations lightning surges are induced in power and signal transmission lines and in many cases equipment is damaged. Modern electronic installations usually consists of a large variety of equipment including telecommunication and computer systems. Most of this equipment contains many solid state devices which are easy damaged by the high voltage surges so the special attention must be paid on the overvoltage protection.

Lightning stroke to the building protection system (lps) gives conducted and radiated electromagnetic disturbances which are very dangerous to electronic equipment operating within this building. It concerns especially the equipment with sensitive semiconductor elements and integrated circuits. In such case the electromagnetic field is due to the lightning current flowing along the channel and current in the conductors of lps. This field influences directly or indirectly the electronic devices. In the event of indirect influence the voltages and currents are generated in:

- unshielded and shielded lines (AC and DC lines, telecommunication lines, interconnection signal lines) connected directly to the equipment,
- big loops formed of wires and conductive elements of the construction or other installations (water pipes, gas pipes, central heating, air conditioning, sewage system and others) in building.

An additional hazard occurs due to potential differences between the particular points within the building. An example of various ways of overvoltages penetration into electronic equipment illustrates fig. 1.

The performance will endeavour to highlight some general principles which need to be considered when providing protection against such occurrences. The protection philosophy behind the protection systems may be applied to any network experiencing electrical type disturbances.

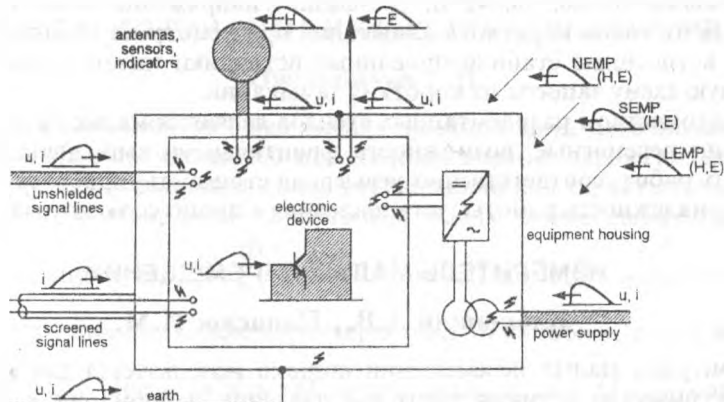


Fig. 1. Examples of overvoltages hazards, danger penetration ways and places of potential spark-over within an electronic equipment.