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LIGHTNING PROTECTION AND ITS IMPORTANCE IN OUR LIFE

Bulin M. N., student
Scientific supervisor – Matusevich O. A., senior lecturer
Belarusian National Technical University
Minsk, Republic of Belarus

Lightning discharges are about 300 million Volts each and have been measured from several thousand Amps to over 200,000 Amps that is enough to light half a million 100 Watt bulbs. In comparison, household current is 120 Volts and 15 Amps. Even though a lightning flash is of a very short duration and it is quite a real cause of damage and area destruction [1]. The consequences of a direct impact are obvious and immediately visible: damaged buildings, fallen trees, injuries and even death. However, there are also secondary effects of lightning: short-term voltage surges, called transient overvoltages, which lead to a catastrophic, albeit less visually obvious damage to electronic systems.

Lightning protection scheme must encompass both structural lightning protection and transient overvoltage (electric systems) protection. That's why all electrical elements should be defended by a lightning protection system (LPS). The aim of a LPS is the transfer of lightning current safely straight into the ground. An overall LPS includes internal LPS and external one. The latter consists of earth termination, air termination system, and a down conductor system. The earth-termination system is designed to provide a low resistance path to disperse high current into the soil. The conductors used in that process are called down conductors. The current passed by a down conductor should be spread securely in the soil without raising the potential of the down conductor to extreme high values that could cause sparks and fire.

References

1. Why Do We Need Lightning Protection? [Electronic resource]. – Mode of access : https://new.abb.com/low-voltage/products/earthing-lightning-protection/furse/news/why-do-we-need-lightning-protection. – Date of access : 15.09.2021.