CALCULATION OF LIGHTNING AND LIGHTNING ARRESTER AND FIRE PROTECTION SYSTEM IN FIRE PREVENTION

*Head teacher:***Yoqubjanova Yoqutxon G'ulomjonovna**
Teacher: **Yuldoshev Shakhboz Khoshimjon**
Namangan Engineering Construction Institute

Annotation: *Methods of learning to measure the calculation of lightning arresters in fire prevention. Static electric charges. Static electric charges are formed as a result of mutual friction of two materials that are not the same in terms of structure and composition and as a result of the movement of certain liquids or gases in pipes at high speed. will be*

Key words: *Lightning arrester, Static electricity, voltage, charges*

A lightning arrestor for fire prevention, for example, when a car is moving on a concrete road, as a result of its wheels sliding on the road or as a result of sand and stone particles hitting the car - 3000V, when gasoline is moving at high speed in steel pipes - 3600V, speed 15 In belt transmissions with m/s - 80000V, in belt conveyors static electric charges up to -45000V can be generated. The amount of static electric charge depends on the composition of the materials, the surface of the rubbing parts, their density, specific electrical resistance, the intensity of the technological process and the microclimate of the environment.

Various injuries, fires and explosions can occur under the influence of static electricity charges. In the environment where a high amount of static electric charges are generated, the muscles of the human body are sharply shortened, and as a result of working under the influence of static electric charges for a long time, there is a disruption of nerve activity and a decrease in the quality of the prepared product.The formation and accumulation of static electric charges can be prevented in various ways, including normalization of the microclimate of the workplace, i.e. achieving a relative humidity of room air not less than 70%; adding antistatic materials to the main materials; ionization of ambient air; introduction of charges of the opposite sign to the rubbing surfaces, and b. One of the main ways to protect against the dangerous and harmful effects of static electricity is to connect the metal parts of devices and capacitors to the ground. Steel pipes, angle steels and fittings can be used as electrodes for grounding. The resistance of the grounding devices of stationary mechanisms and capacitors with the possibility of generating static electric charges should be less than 100 Ohm, and for equipment, devices and equipment systems participating in the technological process, this indicator should be less than 10 Ohm. .

During lightning and thunderstorms, strong electric charges are formed, their voltage ranges from 2V to 8 million V, and the current reaches 200,000 A, and such charges can cause great damage to buildings, people and animals, as well as cause

various fires. At this time, the effect of lightning can be primary (direct strike) and secondary (in the form of electrostatic and electromagnetic inductions). Therefore, it is necessary to install lightning reflectors in buildings and structures. Lightning arrestors consist of three elements: a lightning receiver, a current conductor and a grounding system. They are in the form of mast, antenna and net. The simplest design of a lightning arrester consists of a lightning arrester installed on the roof and a rod connected to the ground. Such a mast forms a protective area in the form of two cones with a rounded base around the building. Its radius is one and a half times greater than the height of the lightning arrester. When determining the size of the lightning arrester in the form of a scheme, the contour of the building is first drawn to scale, and then the height of the lightning arrester is determined, and a secondary cone is drawn on this scale. If the building with all its parts is placed inside the cone, the selected height of the lightning arrester is considered to be sufficient to protect the building from lightning, otherwise, in the scheme, the height of the lightning arrester is taken higher and the secondary cone is again

drawn and inspected. Lightning receivers are made of steel rods with a length of 1.0...1.5 m and a cross-section of not less than 100 mm2 and are attached to tubular, reinforced concrete or wooden supports. In long buildings, "cables" with a cross-section not smaller than 35 mm2 and stretched between two masts are used. Conductors are made of steel rods or wires with a diameter of not less than 6 mm, and electrodes are made of steel rods with a diameter of not less than 10 mm. All joints in the lightning arrester are welded together. Bolted connections are only allowed to be used in temporary grounding devices.

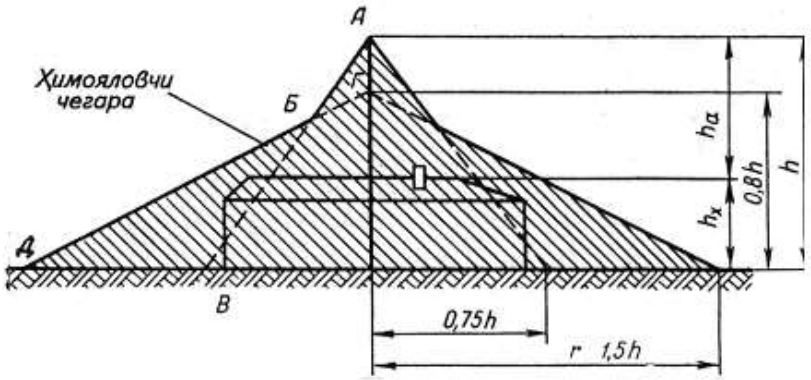

Figure 1.1. A single rod lightning rod

All buildings and structures are divided into 3 categories according to the risk of lightning. Objects of the first category include explosive-hazardous industrial buildings of class V-I and V-II; the second category includes production buildings of class V-Ia, V-Ib, V-IIa; the third category includes buildings of explosive class P-1, P-2, P-2a.

The protection zone of lightning reflectors depends on its size, it is determined depending on the height, width and length of the building. Protection zones are divided into two types:

-A - confidence level is higher than 99.5%; -V - confidence level is higher than

95%.

To protect two or more buildings located close to each other from lightning, antenna or "mesh" lightning reflectors are used.

The fire protection system is a set of organizational measures and technical tools aimed at eliminating the impact of the dangerous factors of fire on people and limiting the amount of material damage during a fire.

Fire resistance of buildings and structures and ways to increase it. Fire resistance means the ability of materials and structures to maintain their strength in fire conditions. The time when construction structures lose their properties and strength under the influence of fire is called the fire resistance limit.

All buildings and structures are divided into 5 levels according to fire resistance:

I level fire resistance buildings include buildings with a high fire resistance limit (0.5-2.5 hours), all structures of which are non-combustible;

II degree fire resistance buildings include buildings with non-flammable structural elements and a high endurance limit (0.25-2.0 hours).

Buildings and structures of fire resistance level

III are made of non-combustible and hard-to-burn materials;

Buildings with fire resistance level IV include buildings whose entire construction is made of hard-to-burn materials;

Level V buildings include buildings whose entire structure is made of combustible materials.

The required level of fire resistance is determined depending on the construction, function, number of floors of buildings and structures, the fire hazard of technological processes and the availability of automatic fire extinguishing devices

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