Electric power transmission line is component of electrical grid intended for transmission of electric power produced by electric power plant to consumers. For nowadays it is important to provide security near power lines because many people die near lines because of their ignorance every year. Neglect of people causes many emergencies. Our goal is to enlighten people so number of accidents will decrease.

Electrical grid consists of electric power plant, step-up transformers near the plant, transmission line and step-down transformer near the consumers. Energy generated by electric power plant is converted to higher voltage electrical energy. Then received energy is transferred over long distances. This is due to the fact that there is connection between voltage of energy and loss of electrical energy (1) which is expressed by next formula:

\[ P = I^2 \cdot R, \] (1)

where: P is power losses, (W), I is current, (A), and R is resistance (Om). [1]

That is why voltage is increased before transmission and decreased after it. The losses of operations like increasing and decreasing are smaller than losses mentioned before and can be ignored.

After energy is transferred over some distance, it gets into the transformer, which is located near the consumers. Received energy is about 220 V. It is transmitted from transformer to houses, connected to electrical grid.

When calculating a power line, the following parameters must be taken into account: the shape of the catenary which is a function of the conductor weight per unit length, w, the horizontal component of tension, H, span length, S and the maximum sag of conductor D. Conductor sag and span length are illustrated in fig. 1 for a level span.

The dip of the conductor between the two level supports is called sag (Fig. 1). In other words, the vertical distance between the highest point of the electrical pole or tower (where the conductor is connected) and the lowest point of the conductor between the two adjacent level supports is known as sag shown in the figure below. The horizontal distance between two electrical supports is called the span. [2]
Fig. 1. **Immersion of the conductor between two support supports**

Sag is also shorter in winter, than in summer because of temperature. Core is made of steel and cable is made of aluminum so in the summer summary length is bigger because metal structures are wider while in warm environment. That’s why electrical engineers made cables longer than spans.

But not only temperature affect to the sag. There are also next factors:
1. Conductor weight – sag is directly proportional to weight, and weight is increased due to ice loading.
2. Span – sag is directly proportional to square of span length.
3. Tension – sag is inversely proportional to conductor’s tension, so higher tension increases the stress in the insulators.
4. Wind – increases sag in the inclined direction.

Of course, this structure has many advantages and disadvantages. This structure is rather reliable. The most of reasons of breakdowns is connected to drivers, who knock down transmission towers. All the possibilities to decrease the number of these incidents are to make the ice resistant road, but it is not so economically profitably.

Another big problem is isolation breakdown by lightning, the wind and other weather factors. In this case the cable breaks off and electric system shuts off power. So, to fix this problem automatic circuit reclosers (ACR for short) were invented. In case of lightning strike to cable appears short circuit and power supply stops. Then recloser supplies electric energy again and check does short circuit disappear or not. If it isn’t disappearing, recloser stops supply again and special group of electrical engineers are called.

According to Ukrainian standards, the number of insulators in garland is: for 10 kV line – 1, for 35 kV line – from 3 to 5, for 110 kV line – from 6 to 8 and for 220 kV line – 15. So, living near the zone of transmission line can be dangerous, and it is better to place your house in some distance. [3]

As you probably know, production of cables is expensive, so designers of electric power transmission lines are trying to cheap this process. For example, it is known that energy flew from positive anode to negative cathode. Also earth is known to be a good conductor. So, why should circuit include two wires if it can use one, and earth will be second one? That is why new power transmission lines use only one wire.

But what can be wrong with this power lines? It is known that most of accidents occur because of human’s mistakes. There are many instructions how to avoid dangerous, but statistic is known.
First of all, children are susceptible to attacks because they like to play near the power transmission lines, play with wires etc. To decrease the number of accidents we should teach them that electric power grid is not suitable for their games. Children should know that electric current is very dangerous if you don’t know how to use it.

The second group who is in higher dangerous are fishermen. Fishing is pleasurable thing, but it could lead to accidents. When moving to village you should remember and adhere to basic safety regulations. Fishing near the transmission lines is forbidden. In Zaporizhia region fisherman got a 10 kV voltage strike when casting a fishing rod.

The third groups are drivers of large cars. For example, in Mykolaiv worker loading a track brought the boom of a loader crane to a wire for invalid distance. Electric arc appears and hurts worker to death.

Conclusions: So, what could I say in conclusion? Electric power is very important and integral part of our everyday life, but we must adhere to safety rules to reduce the number of accidents to a minimum.

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DOI 10.36074/15.05.2020.v5.30

IMMUNOLOGICAL ASPECTS OF PHYSICAL CULTURE AND TREATMENT-PREVENTIVE NUTRITION

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The external environment began to affect the human body more and more destructively. Hypodynamia, increased emotional stress and various types of stress changed the nature of nutrition, which led to violations in the immune system: the risk of allergic, autoimmune, immunodeficiency and respiratory diseases increased. To the conditions that contribute to the rapid spread of infections among people with weakened immune systems (the HIV epidemic and the appearance of atypical viruses), the high population of modern large cities has also been added.