

And perhaps the most significant drawback of alternative energy sources is their uneconomical nature. This is due to the fact that the installations themselves and power plants in general have a high cost relative to how much energy they produce [2]. In other words, the electricity received from such sources turns out to be very expensive. The situation could be corrected by a significant reduction in the cost of production of installations, which is quite problematic. Another way out was a multiple increase in the energy produced, which even with high efficiency will not be achieved, since wind or solar energy itself is small.

In contrast, we can give an example of nuclear power plants as the most economical [2]. The cost of construction and subsequent purchase of uranium rods is commensurate with alternative sources. However, the power generated is an order of magnitude higher. This means that the cost of energy at such a power plant can be several times cheaper.

One of the reasons for the smooth displacement of nuclear power plants in Europe is a concern for safety. But progress does not stand still and now the level of security at such stations is much higher than it was before. The risk of various kinds of accidents is almost zero.

As a conclusion, we can say that nuclear power plants have a great potential. Perhaps it is necessary to develop this industry, and not to displace it, today, with less efficient wind and solar energy.

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MODERN EQUIPMENT FOR CONSTRUCTION OF AIRLINES

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Power line – is a one of the components of the electrical network, a system of power equipment designed to transmit electricity by electric current. Also, an electric line as part of such a system that extends beyond the substation power plant. Overhead transmission line (OHL) - a device designed for transmission of electricity distribution through wires, located in the open air and attached by means of traverses (brackets), insulators and fittings to or supports other structures (bridges, overpasses) .

The construction of the transmission line, its design and construction are regulated by the Rules of arrangement of electrical installations and Building norms and rules

Types of supports. Power line towers are designed for the construction of power lines with a voltage of 35 kV and above at a rated outdoor temperature of -65 ° C and is one of the main structural elements of power lines (power lines), responsible for mounting and hanging electrical wires at a certain level. Depending on the method of suspension wires, the supports are divided into two main groups:

- intermediate supports on which wires are fixed in supporting clamps;
- anchor-type supports used for tensioning wires; on these supports of a wire are fixed in tension clips.

Intermediate direct supports are installed on straight sections of the line. On intermediate supports with suspended insulators of a wire are fixed in the supporting garlands hanging vertically; on supports from pins insulators fixing of wires is made by wire knitting. In both cases, the intermediate supports receive horizontal loads from the wind pressure on the wires and the support and vertical - from the weight of the wires, insulators and the own weight of the support.

Intermediate corner supports are installed at the corners of the line with the suspension of wires in the supporting garlands. In addition to the loads acting on the intermediate straight supports, the intermediate and anchor-angular supports also perceive the loads from the transverse components of the traction of the wires and cables. At angles of rotation of the power line more than 20° the weight of intermediate angular supports considerably increases. At large angles of rotation anchor angular supports are established.

At installation of anchor support on direct sites of a route and a suspension bracket of wires on both parties from a support with identical drafts horizontal longitudinal loadings from wires are balanced and the anchor support works as well as intermediate, it accepts only horizontal cross and vertical loadings. If necessary, the wire on one side and on the other side of the support can be stretched with different pulls of the wires. In this case, in addition to horizontal transverse and vertical loads, the resistance will be affected by the horizontal longitudinal load [1].

Designs of supports. Reinforced concrete, steel and wooden supports are used in the construction of power lines. By purpose, the supports are divided into anchor, corner, end, intermediate; by the number of chains - single- and double-chain. On constructive execution of support are divided into free-standing and on distractions with hinged fastening to the base. Reinforcing the design of the traction support can be in free-standing supports. Braces can also be used. Unification and standardisation of supports help to increase the technical level of linear construction. As a rule, anchor-angular supports are calculated on a corner of turn to 60° . The values of the limit angles of rotation on the intermediate-angular supports are indicated on the assembly diagrams of the supports and in the explanatory notes. Steel anchor-corner supports are also used as final ones. Instead of the raised intermediate steel supports of 35 sq.m. it is recommended to apply supports of 110 sq.m.

In the presence of feasibility studies, supports can be used in other conditions than those accepted in the design of supports. For example, supports for mountain lines can be used on rough terrain and on flat sections of lines passing in IV and V wind areas, supports for urban conditions can be used on routes of lines outside cities, supports for lines of higher voltage can be installed on lower voltage lines (for example, in areas with a polluted atmosphere, when crossing obstacles, etc.).

Installation of overhead power lines. The technological process of installation of the transmission line (transmission line) includes:

- preparatory works, during which they get acquainted with the area of the route, break the route, cut clearings, dig pits for supports, prepare various kinds of industrial, economic and communal premises;
- basic construction and installation works, during which places are transported, supports are assembled and installed, insulators, wires and cables are delivered and installed [2].

Assembly of supports. The process of assembly and installation of supports includes: laying of reinforced concrete racks and individual elements of steel supports, assembly of the support, installation of the support in the design position, its adjustment and fixing. As a rule, the laying of the support and its elements is made along the axis of the transmission line. In some cases, based on the terrain and the conditions of its rise to a vertical position, the laying and assembly of the support is made across the axis of the OHL route.

On sloping hills, laying and assembly of supports must be done along the axis of the overhead line, traverses towards the rise of the sloping hill. At the intersections of the transmission line with road and railways, rivers and ravines, as well as communication lines of the support are laid along

the axis of the line, traverses and cable-resistant towards intersecting objects at a distance from the center of the support to the intersection of at least 1.5 height supports. This distance is considered: from the center of a support to a ditch edge at crossing with highways; with railways - to the projection of communication lines and auto-blocking, and in their absence - to the edge of the main ground; with ravines - to their eyebrows; with rivers - to the water's edge; with communication lines and OHL lines - to the projection of their extreme wire.

If during the inspection of the support before assembly separate elements of supports with damages are found, it is forbidden to start its assembly before correction and replacement of these or elements of details [1].

Lifting and installation of supports. Installation of reinforced concrete supports is made, as a rule, by jib cranes and cranes-installers of supports like KVL. If it is necessary to tighten the racks, a tractor is used. The diameter of the cylindrical drilled boiler should not exceed the diameter of the rack by more than 25%. At the big difference the top crossbar is established. Crossbars on intermediate supports are located along the axis of the overhead line. The time between the device of a pit and installation in it of a support should not exceed one day. At installation of two-rack and portal reinforced concrete support installation of one and the second steady, then installation of a traverse, the top ends of cross ties between racks and fixing of the bottom ends of cross ties is made. After lifting and installation by the crane of free-standing support in the dug ditches, supports should be temporarily unfastened by extensions, and then the lower and top crossbars are established. The final fixing of supports is carried out by backfilling with soil only after their adjustment by filling in sinuses of soil with layer-by-layer ramming.

Installation of wires and cables. To perform the main operation during the installation of wires - hanging on the supports of the wires - a number of preparatory operations are performed, including:

- delivery of drums with wires to the place of their unrolling;
- delivery of insulators and fittings to pickets, where they are assembled;
- bookmark anchors for intermediate anchoring of wires (if necessary) in long anchor spans

[2].

Conclusions. The community is currently living in an era of progressive energy crisis. However, the intensive use of non-renewable energy sources for heating, vehicles, road construction machinery, agricultural machinery and various household appliances, produces a huge amount of oxides of carbon, sulfur and nitrogen. All this contributes to rising temperatures of the earth's and water's surface, causes environmental pollution, acid rain, and stimulates intense melting of ice, rising ocean levels, flooding of vast land areas, the emergence of cyclones and hurricanes covering entire continents. Therefore, the development of alternative energy solutions based on non-traditional approaches, as well as with the use of renewable sources is important. Research in the use of renewable energy sources is associated with the creation and practical application of solar and wind installations, hydroelectric power plants and various types of converters. The energy resources produced in this case, in addition to the intended use, can also be accumulated by various storage systems.

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