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BACKGROUND PRINCIPLES ADAPTIVE CONTROL LOAD AUTONOMOUS WIND TURBINES

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Possibly to reach high power efficiency of aero mechanical system of the wind electrical unit on condition of maintenance of optimum angles of attack of the forward area of blades concerning the direction which changes on the speed of a wind and a torque. But under these conditions the frequency of rotation of a rotor with blades changes stochastic with a wind speed on which power depends cubed. Power of a wind stream changes in time behind the probabilistic law which describes, for example, Veybull's distribution. Thus, it is accepted by a rotor with blades the variable power of a wind stream in the absence of accumulators has to be developed at the same time on variable in size to electric loading. Therefore development for the wind electrical unit of a control system which considers the variable power of the wind engine, to adaptive loading, is an actual task.

Research objective – consideration of the general principles of adaptive regulation of loading of independent wind electrical units in the mode of variable speed of a wind turbine.

For system of electromechanical transformation of energy of a wind stream, variable on speed, the input parameter of power it must be kept in mind not the speed of a wind, but a torque and angular speed of rotary volume of a rotor with blades that has inertial indicators which are especially actual for independent wind electrical units in which there is no reducer. In this case the block diagram of automatic control of aero mechanical system at a stage of obtaining energy of a wind stream a rotor with blades is represented by transfer functions with one inertial site.

Conclusions

In a control system of wind installation of informative parameter of the power of a wind stream received by the wind engine it must be kept in mind stochastic function of speed which is derivative stochastic function of instantaneous velocity of a wind and considers a rotor lag effect with blades.

Stochastic function of speed of a rotor with blades can be considered as ergodic process for which it is possible to calculate an assessment of a population mean and dispersion of an assessment of a population mean by analogy with known probabilistic dependences.

In system with adaptive regulation of load of consumers divide into two separate groups: the stochastic mode of energy consumption for domestic and production needs and power utilization adaptive burden which is shared in turn on thermal power and electric technological subgroups. It provides technical capability of maintenance of power of power consumption, considering change of power of generation in the mode of the maximum values of efficiency of electromechanical transformation of wind energy.

The articlediscusses the generalprinciples ofadaptiveload controlof autonomouswind powerplantsin the variablespecific speedwind turbine.

Wind powerplant, the block diagram, the algorithm is adaptiveload control.