

STRUCTURE OF AUTONOMOUS WPS FOR AGE ELECTRICITY SUPPLY

Fedorov Artem, Soloviev Bogdan, Students, Institute of Energy

Supervisor: ScD. in Engineering, vice-rector, Hutsol Taras

State Agrarian and Engineering University in Podilia

The central element of the AGE power supply system with the use of wind energy is the wind turbine itself. Its choice is related not only to the desired power consumption, but also to the specific conditions of its use. Preferably wind turbines are installed in close proximity to production and living quarters, and noise and vibration levels should not exceed the set limits.

This means that when choosing a wind turbine for the AGE power supply, it should be limited to low power units. A characteristic feature of the use of low-power wind turbines is the inability to directly connect consumers to wind turbines, due to the fact that the current parameters, in particular its frequency are unstable.

This is due to the fact that for small wind turbines it is inappropriate to install wind turbine speed control systems. For this reason, a system of electricity storage should be a mandatory element of the wind farm. It should also be borne in mind that most electrified processes in agriculture involve the use of alternating current standard parameters.

Therefore, the wind farm should include an inverter – a device for converting direct current to alternating current. In addition to all of these elements, the power generation subsystem must also include an automatic control unit, which is responsible for managing the electricity flow.

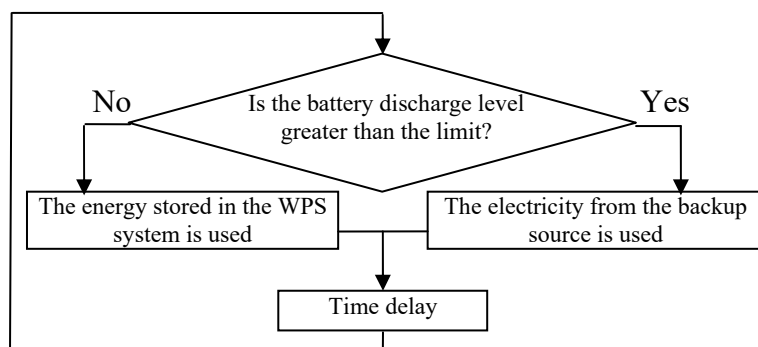


Fig. 1. Logic diagram of operation of the control unit of energy flows in the system of production-consumption of electricity in the AGE

A simplified logic diagram of control of electricity flows in subsystems of its production and consumption is shown in Fig. 1.

Based on the above, the AGE power system based on the use of wind energy will have the following structure:

- 1) wind turbines or their complex;
- 2) accumulation system;
- 3) control unit with inverter;
- 4) backup source.

Elements 1-3 represent the actual wind farm.

References

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