

УДК 621.311

Sedletski V., Podmazova A., Bankovskaya I.

Types of Power Plants, Its Advantages and Disadvantages

Belarusian National Technical University
Minsk, Belarus

Nowadays it is impossible to imagine the energy supply to cities and without specially equipped stations. Therefore, various power plants are being built everywhere for this aim.

A power station is a complex of buildings, structures and installation designed to generate electric energy.

The hydroelectric power station is the power plant transforming energy of moving water to electric energy. They are classified according to the use of natural resources: platinic, dam, derivational and pumped storage [1].

Advantages: electricity generation, renewable energy use, ease of control, quick transition to operating mode, the absence of the atmosphere pollution. Disadvantages: attachment to reservoirs, possible flooding of arable land, hydroelectric power stations can be built only on flat rivers (because of the seismic danger of mountains).

Thermal power plants can be with gas and steam turbines, and also with internal combustion engines. The most common thermal stations with steam turbines are divided into: condensation (CES) – in order to rotate the turbine all steam in it is used and generate electric energy; heating power plants (CHP), which are a power source for consumers of thermal and electric energy and located in the area of their consumption. They generate electricity by converting the thermal energy produced by burning the fuel. The fuel is: coal, natural gas, fuel oil, peat or hot shale [2].

Advantages: low financial costs, high construction speed, possibility of stable operation regardless of season. Disadvantages: work on non-renewable resources, slow entry into working mode, waste generation.

Nuclear power plant (NPP) is a station in which thermal energy or electricity is obtained thanks to the nuclear reactor operation. In 2015, all nuclear power plants in the world generated almost 11% of electricity.

During operation, the nuclear reactor transmits energy to the primary coolant. This coolant enters the steam generator, where it heats the water of the second circuit. In the steam generator, water is converted into steam, which enters the turbine and drives the electric generators. Steam after the turbine enters the condenser, where it is cooled by water from the reservoir. The primary coolant is mainly water. However, lead, sodium and other liquid metal heat carriers can be used for this purpose.

These stations are classified by the type of reactor used. There are two types of these reactors: thermal and fast neutrons.

Advantages: independence from fuel sources, environmental cleanliness. Disadvantages: severe consequences in case of emergency.

References:

1. Operating principle of Hydroelectric Power Plants [Electronic resource]. – Mode of access: <https://principraboty.ru/gidroelektrostancii-princip-raboty/#h2-2>. – Date of access: 30.03.2022.
2. Types of TEC [Electronic resource]. – Mode of access: <https://altenergiya.ru/poleznye-stati/princip-raboty-i-tipy-tec-ustrojstvo-tes.html>. – Date of access: 31.03.2022.