UDC621.3

ENERGY SAVING AT THE ENTERPRISES ON PRODUCTION OF MEDICAL PRODUCTS PRODUCTION

Baykovsky A.A.
Scientific adviser Skuratovich I.V.
Belarusian National Technical University

The article discusses energy conservation measures of the Unitary Enterprise "FreBor".

An important element in the cost of production of any enterprise are the costs associated with the provision of fuel, heat and electricity, including the cost of maintenance, repair and depreciation of power equipment. This problem is also relevant in connection with the constant increase in the cost of energy carriers in the Republic of Belarus: natural gas, oil products, electric energy.

Unitary enterprise "Frebor" for production annually consumes about 9 thousand tons of conventional fuel. The company produces energy-intensive products-chemical fibers and threads, compressed air, as well as synthetic resins and plastics. Unitary enterprise "Frebor" is one of the most energy-intensive enterprises of the Minsk region, which means that energy saving is a paramount task.

The company uses more than 10 types of energy: electricity, natural gas, steam, hot water, compressed air, chilled water, distillate. At UE "Frebor" the combined power supply is applied, thus the electric power and natural gas the enterprise receives from the regional power system, and heat and other types of fuel and energy resources (TER)-from own generating installations.

Thermal power generation is carried out in its own gas boiler (efficiency is not less than 93 %), compressor and refrigeration stations (1 kW of electricity consumed produces up to 7 kW of cold), recycling (re) water supply systems circulate up to 1000 m3 of water per hour.

Energy saving measures at the enterprise can be divided into the following areas:

– development and implementation of energy saving management system;

– organization of work of technological and auxiliary equipment to increase its load, reduce the maximum load and equalize the daily schedule of power consumption;

– introduction of devices and systems of accounting of consumption of fuel and energy resources;

– improvement of existing and introduction of new energy-efficient technological processes, equipment and materials;

– improving the efficiency of heating and ventilation systems;

– increasing the efficiency of own energy sources; reactive power compensation.

The energy-saving effect can be achieved through the implementation of measures practically without additional capital investments (control over the operating modes of equipment, increasing its load, stimulating personnel, etc.) and modernization and reconstruction of production with the introduction of highly efficient energy-saving technologies, equipment and materials.

One of the measures for energy saving is thermal insulation of reinforcing and connecting heat engineering units with high temperature background of the surface.

At the Unitary enterprise "Frebor" the facts of presence of the raised thermal losses on butt sections of pipelines, valves and other fittings of thermal knots are established. Elimination of these heat losses can be carried out by the introduction of removable thermal covers (figure 1).

Fig. 1 – Thermal insulation cover

The main advantage of thermal covers over disposable insulation made of mineral wool with a metal casing is the possibility of reusable use, convenience during repair, audit and periodic inspection. Thermal covers operate at temperatures from -60 °C to + 550 °C.

At the enterprise the facts of work of outdated lighting devices with high installed capacity were revealed. In this regard, it is necessary to replace a number of the most energy-intensive lamps with modern led (figure 2).

Fig. 2 – Led indoor lighting fixtures

The economic effect of replacing incandescent lamps, fluorescent lamps, arc mercury lamps with led lamps is achieved by reducing the installed power while maintaining the operating light characteristics and increasing the average life of the lighting device.

Economy of led lamps consists in small consumption of the electric power. The led lamp is 3 times more economical than the energy-saving one and 7.5 – 9 times more economical than the incandescent lamp.

Another important advantage is the response time: they have an instant start, do not need heating. It is also possible to note the long service life. Led bulbs have a lifespan of 30,000 to 50,000 hours of operation.

The most effective energy-saving measures planned for implementation in the coming years at UE "Frebor" is the use of a waste gas heat recovery boiler at a waste incineration furnace.

Systematic implementation of both organizational and technical (low-cost and medium-cost) energy saving measures at the enterprise will significantly reduce (up to 322 tons) annual energy consumption, respectively, reduce emissions of pollutants from fuel combustion.