

EFFICIENCY OF LOW PRESSURE HEATERS OF THE REGENERATION SYSTEM OF THE HIGH-POWER TURBINE

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Efficiency of electricity generation is one of the main requirements for power plants. The use of regenerative heating of feed water allows to obtain a higher average temperature of heat supply, which leads to an increase in the thermal efficiency of the turbine.

The basis of the technological process of conversion of thermal energy into electricity is the thermal scheme of the power plant. The calculation of the thermal scheme of the power unit is performed in order to determine the technical characteristics of the equipment included in the unit and the economic indicators of the power plant as a whole.

Both mixing and surface low pressure heaters can be used in the thermal scheme of the power unit C-300-240 of JSC "Turboatom". To evaluate the efficiency of low pressure heaters, thermal calculations of the thermal scheme for the cases of using of surface and mixing low pressure heaters in the regeneration system were performed. The design features of mixing and surface low pressure heaters were considered and their thermal calculation was performed.

Analyzing the results of calculations, we can conclude that when installing two mixing heaters instead of surface heaters, you can get higher temperatures in the path of low pressure heaters and a small increase in turbine power. However, these advantages do not compensate for the cost of installing an additional pump in front of the mixing heater. Calculations have shown that mixing heaters have a more cumbersome and complex design, because they must provide for an increase of the collision surface of water and steam by breaking the water into jets, drops, films. However, there is a significant advantage – the practical absence of underheating of the condensate to the saturation temperature of the heating steam.

Thus, it can be concluded that the scheme of combined connection of mixing and surface low pressure heaters may be most appropriate. As a result, it is possible to obtain stable heating of water almost to the saturation temperature of the heating steam in the first stages of heating, reliable operation of subsequent surface heaters, reducing heat loss in the heaters.