

Student name: Xu Wei (Bachelor)

Supervisor: Dr. Tupov V.B.

Dep. of Thermal Power Plants, National Research University “Moscow Power Engineering Institute”

Work title: Thermal power plant with 530 MW units. Noise reduction from GTU with a capacity of 300 MW on the example of China.

Annotation:

The first chapter of the graduation qualification work contains the calculation of the thermal scheme of the K-530-240 power unit at the rated operating mode. The following parameters were determined: water and steam parameters, working fluid flow rates, energy indicators of the power unit.

In the second chapter, based on the calculation of the thermal scheme, the main and auxiliary equipment of the power unit was selected, as well as technical specifications were drawn up for equipment requiring modernization for this steam turbine unit. An extended schematic diagram of the power unit has been developed.

In the third chapter, thermal, design, hydraulic and strength calculation of the high-pressure deaerator was carried out. Based on the calculation results, an assembly drawing of a high-pressure deaerator was developed.

Chapter 4 examines the noise from China's new 300 MW gas turbine plant. Noise levels emitted from GTP suction system, gas turbine casing and exhaust system are considered. Using the AWS Acoustics program, sound pressure levels and sound levels in the surrounding area were calculated. The required reductions from each source were determined to ensure sanitary standards along the border of the sanitary zone at a distance of 200 m from the station. Comparison of Chinese and Russian sanitary standards for noise was performed. Possible measures to reduce noise from each of the sources are considered. Based on a review of the data, effective mufflers for the air intake and exhaust ducts, as well as a casing to reduce the hull noise of the 300 MW GTU are recommended. The calculations carried out show that after the implementation of the proposed measures, sanitary standards for noise will be met at a distance of 200 m from the station.