SUMMARY OF DISCIPLINE

1. Name of discipline Processes and modes of operation of power plants

2. Symbol (code) in the curriculum M.1.V5

3. Direction (PLO) 13.04.02 Power and Electrical Engineering

4. Profile Management training modes of electric power systems

5. Qualifications (degree) Master

6. Providing Unit Department of APEC ENIN

7. Teacher NN Galashev, tel. 701 777, E-mail gal@tpu.ru

9. The results of the development of the discipline

P8: the ability to analyze scientific and technical information, put to decide and publish the results of solving complex engineering analysis with the use of basic and specialized knowledge, standard documentation of modern analytical techniques, methods of mathematical analysis and modeling of theoretical and experimental studies;

P11: the ability to use the methods of analysis and simulation of electric power facilities equipment.

10. Contents (list of the main topics (sections)

1. Load Charts and types of power plants (16 hours)

Charts electrical load of power systems. Types of plants and their participation in filling the load curve. Technological structure of TPP. The maneuverability and power grids.

2. Processes of thermal power stations (30 hours)

Technological scheme of condensing power. Cycle

steam turbine plant. Ways to improve the efficiency of the Rankine cycle.

Intermediate superheat. The regenerative feedwater heating.

Technological schemes of combined heat and power. backpressure

turbine. Turbine plant with industrial and district heating

controlled steam and condensation. CHP Work on the thermal and

electric load schedules. Fuel economy at

cogeneration.

3. Processes in the TPP equipment (32 hours)

Fuel and combustion process. Drum and once-through boilers.

reliable operation of the boiler Factors (hydraulic regime; stability

the combustion process; slagging; corrosion tail surfaces).

The minimum and maximum boiler load. The storage

capacity boilers. Modes of operation of the boiler.

The process of conversion of heat to mechanical work in the turbine.

Multi-stage and multi-cylinder turbine. The minimum and

maximum load steam turbines. steam control system

turbines. Static characteristics of SAR turbine. control mechanism

turbine. The dynamic properties of large steam turbines.

4. Modes of TPP and HPP equipment (30 hours)

Thermal stresses in the metal TPP equipment.

Cyclic thermal and metal fatigue. field inspection

metal.

Maneuverability units and non-block power. Range

Units loads. The speed of loading units. Catch

load rotating reserve. Transients in pounce mode

load. Mutual influence of the boiler and turbine. Pre-ostonovochnye modes

TPP equipment.

Types of hydroelectric power plants. Manoeuvring characteristics HPP. Participation in HPP

covering electric load schedules.

11. Course 1; Semester 2; the number of credits 3.

12. Prerequisites "Set the mode of electric power
systems, modern methods and means of calculation "," Transients
in electric power systems. "

13. Korekvizity "emergency control in power."

14. Type certification (exam, test) Exam

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