

## DEVELOPMENT OF ENERGY-SAVING AUTOMATED CONTROL SYSTEM OF POWER PLANTS

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One of the main directions of the development of ACS for power units is the automation of diagnostics of the state and conditions of operation of power equipment. Unfortunately, we have to state that its operative and predictive diagnostics have not yet received proper development at TPPs and NPPs of Ukraine, despite the availability of modern measuring devices, computing equipment, and information technologies.

At the same time, the state of power equipment at the TPP, which has been in operation for a long time, determines the urgency of creating automated systems of technical diagnostics (ASTD) for operational control and forecasting of its reliable operation.

According to foreign data, the creation of ASTD makes it possible to significantly increase the efficiency of energy production. Thus, according to the US Institute of Industry, the operating cost of 1 MW at a thermal power plant during the design period of operation is \$24.3; when meeting the deadlines for planned and preventive repairs (PPR) - 17.4 dollars, and when creating ASTD - 12.5 dollars [1].

Analysis of the state of automation of power units as the main structural parts of thermal power plants and its correspondence to the currently available potential possibilities of the theory and practice of automatic control allow us to state the following.

1. Operating automatic control systems of power units were mainly put into operation at TPPs, but were developed even earlier and therefore are now morally and physically obsolete.

2. Due to the insufficient reliability of the control means, unpreparedness of the technological equipment and the lack of the necessary algorithmic support, almost only information-computing systems (ICS) are used in the operational ACS, and the control functions are assigned to various autonomous regulatory control systems instead of control computing complexes (ACCs).

3. There are no necessary information connections in the hierarchical system of automated control "power unit-power station-power system".

4. Despite the available current information in the ACS of power units, it is ineffectively used to solve such important tasks as operational analysis of technical and economic indicators (TEP), determination of energy characteristics of equipment, conducting "express tests", intellectual support of the operator, environmental monitoring and other tasks.

Therefore, the issues of rehabilitation and modernization of those ACS TP power units that will be in operation within the next 15-20 years have become especially relevant now. One of the most important components of this complex problem is also the automation of diagnosing the state of power equipment and operating conditions in the control system of power units of these TPPs.

Thus, it is possible to establish the necessity of integrating the tasks of technological and economic management, as well as diagnostic support of power units within the framework of the integrated control system of the TPP.

### Reference

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