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Automated control of boiler plant using energy-saving technologies

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Global problem of mankind is the problem of energy saving and rational use of fuel. Loss of energy in the fuel is largely dependent on the excellence of its combustion. Simultaneously with the construction the furnace unit and mode of operation of the boiler, the efficiency of the combustion process depends on the quality of the automatic control of fuel and air into the furnace of the boiler.

Optimization of the combustion process is achieved by maintaining the pressure ratio of fuel and air in accordance of the map regime . Such a method is not effective enough, because it does not allow to keep track of changes in temperature and humidity, the calorific value and the gas temperature and other external factors. Therefore at drafting of the map regime assumed the presence of considerable surplus of air to prevent the formation of chemical underburning. As a result, in some cases amount of air exceeds the optimal in the 1.5 ... 2 times. This increases the power consumption for the air supply and leads to the need of excessive heating of air, that is, the additional fuel consumption.

Modern automatic system optimization of the "fuel-air" built using stationary gas analyzers that provide the regulatory process on the content of oxygen in the flue gases. For some types of boilers, these systems of regulation envisaged project documentation is mandatory. However, these systems usually do not work in control systems, and the analyzer is used in the control, due to several reasons:

- the concentration of oxygen in the flue gas depends not only on the intensity of the air, but the other conditions, which in turn reduces the efficiency of the system to control the oxygen content;
- - not all controllers have reliable algorithms for gas analyzers. Many control algorithms do not account for transient load changes the boiler.

The study of the combustion process shows that a lack of oxygen leads to a sharp increase in CO levels. The combustion process control system based on the measurement of the concentration of CO, has a greater sensitivity to changes in combustion characteristics. In this case regulation supports the regime at the border of the chemical underburning, while avoiding significant fuel consumption.

KEY WORDS: energy saving, boiler plant, automatic, system optimization.

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