

# Design Of Fuzzy Control System Of Capacity Of Power Generating Attitude

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**Annotation** – The way of management by capacity of a power generating attitude with a fire chamber of low-temperature boiling layer (LTBL) by means of regulation of the active area of a boiling layer is presented in this article. The model of fuzzy control system of capacity of the power generating attitude with a fire chamber of LTBL is resulted.

**Key words** – Power, Low-temperature boiling layer, Active area, Fuzzy control system.

## I. INTRODUCTION

In the conditions of re-structuring and transition to market relations priority in power development there are the directions connected with decrease of the cost price of thermal and electric energy. The question on increase of overall performance of power generating attitudes and reduction of the cost price of production is now extremely actual [1].

Perspective directions of development of power are improvement existing and working out of new technologies of use of different kinds of firm fuel in fire chambers with a boiling layer, designing and optimization of designs of such attitudes, and also creation of their effective control systems.

## II. THE WORK PURPOSE

The decision of a question of regulation of capacity of power generating attitude with fire chamber LTBL can be carried out by realization of a control system by the area of an active surface of a boiling layer [2].

Through complexity of measurement and a constant variation of the majority of technological parameters, transience of processes which pass in top internal space and absence of full model of object of research it is necessary to concentrate attention to creation of a fuzzy control system.

## III. MATERIAL AND RESULTS OF RESEARCH

Advantage of fire chambers LTBL is possibility of their use for burning of many kinds of fuel or utilization of a combustible waste, in certain cases with useful use of heat and in all cases with reduction to quantity of harmful emissions. However for each fuel the fire chamber demands special designing [2].

Steady and reliable work of fire chamber LTBL is influenced humidity, quantity of ashes, by fusibility of ashes, fractional structure and an exit of flying fuel which is used. Also efficiency of burning of fuel of a different kind in fire chambers of the given type is influenced by following factors: factor of surplus of air, temperature in a layer, speed of primary air, time of stay of particles of fuel in top internal space.

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The generalized scheme of model of a fuzzy control system by capacity of power generating attitude with fire chamber LTBL is represented at the Figure 1.

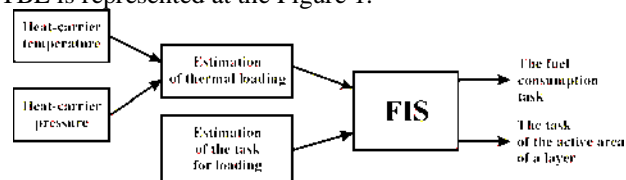


Fig.1. The scheme of model of a fuzzy control system of capacity of power generating attitude

Such fuzzy control system realizes management of capacity of power generating attitude thanks to control of an expense of fuel and the active area of a boiling layer that in turn depend on temperature, to pressure of the heat-carrier and the complex data about a condition of a boiling layer (temperature, height, density, presence of inactive segments and time of their stay in an inactive condition, etc.) that can undertake to some extent to attention depending on the set accuracy of work of a control system [3].

The model of the offered control system is realized in package Fuzzy Logic Toolbox, and also work of the created fuzzy control system is checked up on the simplified model of power generating attitude in package Simulink 7.5 of program Matlab 2010a environment.

## IV. CONCLUSION

The model of a fuzzy control system of capacity of power generating attitude with fire chamber LTBL is presented in this article.

The fuzzy control system will allow to reduce considerably time of reaction of system for loading change, and also to carry out management of capacity of power generating attitude according to an estimation of a condition of an active zone of top internal space.

## REFERENCES

- [1] Інформаційно-аналітичне дослідження стану паливно-енергетичного комплексу України: огляд української преси з проблем паливно-енергетичного комплексу. / упорядник Львівська регіональна Рада НТСЕУ. – №412, 2011, травень – К., 2011. – 50 с.
- [2] Баскаков А.П. Расчеты аппаратов кипящего слоя: Справочник / А.П. Баскаков, Б.П. Лукачевский, И.П. Мухленов, А.А. Ойгенблик, А.Н. Прокопенко, Н.Б. Рашковская, Б.С. Сажин, О.М. Тодес, Н.Ф. Филипповский, В.Ф. Фролов, О.Б. Цитович – Л.: Химия, 1984. – 352 с.
- [3] Штовба С.Д. Проектирование нечетких систем средствами MATLAB. – М.: Горячая линия – Телеком, 2007 – 288 с.