

A.S. Askarova
S.A. Bolegenova
S.A. Bolegenova

SPECIAL FUEL COMBUSTION ISSUES

Study guide



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Reviewers:

Doctor of technical sciences, professor **A.B. Ustimenko**
Doctor of physical and mathematical sciences, professor **M.E. Abishev**

Askarova A.S.
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The study guide discusses proper organization of fuel combustion processes in boiler plants operating on different types of fuel, selection of the burner taking into account the features of the combustion furnace. The manual provides pre-reading materials for the review of burners for various organic fuels, building knowledge about proper fuel combustion management, training in calculating furnace plants for burning special organic fuel, and building knowledge and skills to improve the efficiency of boilers.

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INTRODUCTION

This manual describes solid and liquid fuels and natural gases used in thermal power plants and industrial boiler plants. To ensure the efficiency and activity of combustion process, it is necessary to know the composition, thermal and thermophysical properties of these types of fuels. Generally, for the proper fuel combustion management at TPPs one must be able to understand the schemes for preparing solid fuels, natural gas and fuel oil for combustion. Future heat and power engineering specialists should be able to distinguish their peculiar characteristics, select the combustion device required for the effective use of boiler plant and have the knowledge necessary for its application.

The technology of preparation of solid and liquid fuels for thermal power plants and boilers using solid fuels is given in the textbook called *Fuel Technology at Thermal Power Stations and Industrial Enterprises*. This manual discusses the final schemes for preparing solid fuels and provides the information necessary for designing and using carbon dust preparation systems. In addition, it describes general possibilities of using various fuels at stations. It provides the information on training of experts in the field of fuel combustion in power boilers of industrial boiler plants, on contemporary methods for highly efficient combustion of gaseous, liquid and solid fuels, on the selection and calculation of fuel combustion means depending on the type and composition of the fuel burnt. The purpose of this manual is to explore the basics of the theory of combustion, the mechanism of burning of all types of fuel in steam generator boilers; to describe special characteristics of burning fuels with low calorific value and high ash content and with the pulverized fuel flame combustion mechanism, and efficient fuel combustion methods.