**New methods of coal burning**

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One of the most actual problem of power engineering nowadays is the problem of rational use of energetic resources of our planet. It includes search of alternative heat-carrying agents and also the development of new more effective methods of exploitation of existing ones. The solution of this problem is very important because of critical situation in fuel & energetic industry of Ukraine. The cause of such unfavorable conditions is the deficit of all kinds of fuel, great decrease of the coal production volume and essential deterioration of the quality of extract coal for the last 20 years (ash content of coal run up to 35%).

The solution of this problem is necessary to look for in involving into industry exploitation new power resources, which have not been accounted in fuel and energy balance of the country until now and also the development oh the methods of exploitation fuel resources letting absolutely use of their heat potential and make the loss of energy minimum. One of the way to solve this problem is the installation of the new burning solid fuel technologies by different derivatives of fluidized bed. One of the first place takes the burning solid fuel technology of the low-temperature fluidized bed.

Thanks to installation of this technology it becomes possible to use the supply of low-quality solid fuel, utilization of the wastes of coal mining and separation. It is possible to burn coal of 70% ash content in this way. And the average mechanical waste of coal makes up only 2-3 % under 40% of burning coal in usual grate-fired furnace.

The special feature of this technology is that coal is in air-fluidized bed condition during burning process. It is achieved by blowing air into the funace with the speed which provides suspended condition of the coal particles. It facilitates the oxygen admission to them and makes the burning process more effective. The bed temperature must be between 750 and 850 0C to avoid coal slagging and clinkering. We can use raking off the slag because the ash particles settle-down. The solid fuel feed process is continuous and fuel consumption depends on the bed temperature value. Head emission is achieved by embedded heat surface.

To provide optimum quality index of burning process it is necessary to achieve high quality of the controlled process. The absolutely control of solid fuel burning process proceeding becomes possible with the use of automatic control system of low-temperature fluidized bed. It makes possible to provide necessary heat quality indexes, support technological quality indexes on optimal level and as a result increase the capacity and effeciency and realize emergency control. We can achieve necessary control quality only with the way of complex technological parameters state control in the low-temperature fluidized bed furnace. Following this individual parameter control (e. g. temperature control) must be realized only with the account of the values of all another parameters and on the base of their state analysis make the decision about further burning process control. We offer automatic temperature and fuel consumption control system for low-temperature fluidized bed. It makes possible to hold the main technological parameter –temperature on the order level with the way of solid fuel consumption regulation depends of the temperature value.

It allows to hold the high heat emission level, prevent damade working conditions connected with coal slogging and clinkering, provide optimal fuel consumption. It considerably decreases coal losses and increases the coal use economical effect.

So we can see that the use of the new coal air-fluidized bed technologies with automatic control system development allow to solve the problem of heating resources deficit. And the industry installation of the air-fluidized bed furnace makes the great economical effect (the year summary economy of the 30 air-fluidized bed furnaces is more then 5 million grn).