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IMPROVING THE EFFICIENCY OF EXISTING DRY COKE EXTINGUISHING INSTALLATIONS DESIGNED BY DP 'GIPROKOKS' DURING RECONSTRUCTION AND MODERNISATION

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The article is devoted to practical solutions for improving the efficiency, productivity and environmental safety of existing dry coke quenching plants (DCQP) designed by SE "GIPROKOKS". Due to design reasons (the capacity of the waste heat boiler and smoke exhauster, restrictions on the temperature of the circulating gas in front of the waste heat boiler, the size of the forechamber, the design of the ring channel, space limitations, etc.), some installations cannot be completely converted to low-combustible-component circulating gas operation (with minimal capital investment). Operating such units in low-combustible-component modes will not ensure that the design coke quenching capacity is achieved. In addition, design features do not allow for the effective implementation of some solutions inherent in modern monoblock installations. The article shows possible ways to intensify the dry coke quenching process, increase energy efficiency and reduce emissions (CO).

In particular, it is shown that the intensification of heat exchange in the quenching chamber due to an increase in temperature pressure is achieved by reducing the temperature of the circulating gases entering the chamber. For this purpose, an additional heat exchanger (subeconomiser) is installed in the gas path between the smoke exhauster and the chamber. An example demonstrating the effectiveness of this technological solution is given.

The advantages of using excess circulating gas through the application of waste heat recovery technology based on a waste heat boiler, which makes it possible to increase the energy efficiency of the DCQP by 9.7 %, are highlighted. At the same time, a significant reduction in pollutant emissions (in particular CO) is ensured. The directions for improving the efficiency of the DCQP by reducing coke caking and improving its quality indicators, which affect costs in the blast furnace process, are shown.

A list of elements and equipment used in modern high-power installations of leading global companies is provided.

Keywords: dry coke quenching, waste heat boiler, circulating gas, excess, utilisation, CO content, coke loss, coke quality, energy efficiency, increasing coke quenching productivity.

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