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DEFINITION OF DRY COKE COOLING TECHNOLOGY EFFICIENCY

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As a part of the development of scientific and technical documentation for the reconstruction of coke battery facilities at one of the largest coke production enterprises for metallurgy and one of the largest exporters of chemical products in Ukraine, an analysis of the economic efficiency of implementing dry coke cooling technology was performed. The main issues that required resolution through reconstruction were: improving coke quality, increasing coke production efficiency and reducing harmful emissions into the environment. The project includes the implementation of SE "GIPROKOKS" new technical solutions for improving the technological units of the coke dry cooling plant (CDCP) and dust collection units (with two-stage dry purification), aimed at increasing the CDCP efficiency and reducing enviromental emissions, as well as measures to improve working conditions and safety for the operation personnel.

It has been shown that the total capital investment in the CDCP construction (including the turbo generator) is 14,7 times higher than the wet quenching complex construction.

It has been established that with dry coke cooling technology, operating costs per ton of coke are 17,5 times higher compared to wet quenching technology.

In determining the CDCP economic efficiency, the advantages of dry cooling were taken into account, including: increased revenue from the sale of commercial coke, reduced coke consumption in blast furnace production, utilization of self-produced electrical energy resources, additional low-pressure steam resources from self-production, and additional quantities of commercial coke oven gas. The economic efficiency of implementing dry coke cooling technology has been proven: the non-discount pay-back period is less than the project implementation period by 17 years (the CDCP life cycle is equal to the coke ovens life cycle and is projected to be 20 years), and the calculated level of simple annual internal rate of return on investment is higher by 14,8 % compared to the normative level.

Due to effective technical solutions, the obtained technical achievements have been successfully implemented in the development of scientific and technical documentation for one Ukrainian and three international clients.

Keywords: capital investment, pay-back period, simple rate of return, coke oven and by-product production, reconstruction, coke oven battery, coke cooling, coke dry cooling plant.

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