ENERGETIC ANALYSIS OF HARD FACING AND WELD CLADDING OF AN AIR POWERED DROP HAMMER DAMAGED RAM

by

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This paper studies problems of hard facing of damaged and initially cracked mechanical engineering heavy parts of complex geometry such as large rams of air powered drop hammers. During long-term exploitation, these parts are subjected to thermal fatigue due to cyclic temperature changes and variable impact compression. Taking into consideration high ram costs and difficulties to purchase ram, the necessity of its reparation becomes obvious. The choices of the most suitable technologies of hard facing and welding of an initially cracked ram are also studied here. Besides the techno-economic analysis, an energetic analysis is performed as an additional criterion in assessment of the proposed technology.

Key words: *reparation, hard facing, ram, energetic analysis*

Introduction

Comprehensive theoretical, model and experimental investigations, as well as a detailed energetic and economic analysis, were performed in this paper with the aim to find a unique hard facing methodology for different technical systems parts, improve the existing technologies, choose right filler materials, reduce operating device delays, reach better economic and energetic effects during maintenance, avoid undesired hard facing effects and to perceive possibilities of hard facing and welding applications. Successful maintenance of different parts of forging devices is possible only if a general procedure of hard facing is established. The results obtained here show that positive effects can be expected only if this condition is fulfilled.

Masses of the studied rams vary from 2000 to 6000 kg, depending on the energetic capacity of the air powered drop hammers. This paper investigates the possibility of reparation of the biggest rams of the mass of about m_{UK} = 6000 kg, including hard facing of initially cracked and damaged operating surfaces of the rams.

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