عنوان مقاله:

Optimal Earthmoving Fleet Size for Minimising Emissions and Cost

محل انتشار:

مجله معدن و محیط زیست, دوره 11, شماره 4 (سال: 1399)

تعداد صفحات اصل مقاله: 18

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خلاصه مقاله:

Traditionally, the earthmoving operations have been developed based on the minimum cost per production criterion. Nowadays, due to the negative impacts of the emissions on the environment, there is an increasing public awareness to reduce the emissions from the earthmoving operations. Different management strategies can be employed to reduce emissions, amongst other things, which can also result in a reduction in the operational costs. This paper aims to examine the cost and emissions related to the earthmoving equipment from an operational standpoint. The queue theory is used in order to demonstrate that the optimum cost per production fleet size and the optimum emissions per production coincide. The linear and non-linear server utilization functions are employed to present a general optimization proof independent from any specific case study. The findings of this research work provide a better understanding of the relationship between the emissions and cost and how the under-trucking and over-trucking conditions affect the productivity and environmental affairs in the earthmoving operations.

کلمات کلیدی:

Loader-truck operation, Surface Mining, Fleet size, Emissions, cost