

System Choice of the Technical Maintenance of Locomotives Equipped with on-Board Diagnostic Systems

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Abstract

Any transport company seeks to reduce the cost of maintenance and repair of rolling stock, while maintaining the reliability of vehicles at a high level. Railway companies are aspiring to improve the railway engines maintaining system. However, many railway companies continue to use the preventive maintenance system for railway engines repairs. This system requires considerable funds for remedial maintenance and not always the amount of maintenance corresponds to real needs. The usage of this approach in the organization of maintenance can be considered morally obsolete. Especially this approach is not effective for railway engines equipped with on-board diagnostic systems. The article compares possible options for organizing maintenance and repair of railway engines. The usage of a combined maintaining system for railway engines equipped with on-board diagnostic systems is proposed. The main tasks that must be solved when choosing a system of technical maintenance of modern railway engines are formulated. The peculiarities of the choice of the between overhauls for railway engines equipped with on-board diagnostics systems are considered. A technology for building control systems for the reliability of hauling equipment is proposed. The issues that were discussed are relevant for many railway companies. The transition to more advanced system of hauling equipment maintenance will lead to a reduction in the cost of repairs while achieving a high level of reliability.

KEY WORDS: *organization of maintenance and repair of locomotives, inter-repair intervals, on-board diagnostic systems, choosing a system of technical maintenance of locomotives*

1. Introduction

The target to reduce the operating expenses is relevant for any transport company operating a rolling stock. A significant part of the operating expenses in transport companies falls at provision of properly functioning technical condition of vehicles. In the locomotive sector the majority of operating expenses falls at the share of costs associated with energy costs, as well as maintenance and repair of locomotives. One of the methods of reducing the operating expenses of transport companies is to improve the technical maintenance system of the locomotive fleet.

To date, the repair and maintenance of locomotives of Ukrainian railways, as in most countries of the former USSR, is executed according to a fixed schedule, when the need and type of regular repairs as a rule are determined by the locomotive mileage. This approach does not take into account the actual condition of locomotive nodes and the real need for repair of this type, which leads to significant additional costs. In addition, the lack of information about the size and list of repair works for specific locomotives makes it difficult to plan repair in the depot and significantly increases the time of its execution [1].

Many scientists' researches are devoted to the system optimization of the railway rolling stock maintenance [2-6]. A significant number of researches are devoted to adjustment of the inter-repair interval when the use of planned preventive maintenance system, as well as assessing the impact of the technical state of the locomotives on the inter-repair intervals. Transport companies are seeking to increase the inter-repair intervals in order to reduce their expenses. It should be taken into account that an unreasonable increase of inter-repair intervals automatically leads to an increase of failure probability and this increase generally reduces traffic safety. On the other hand, to ensure a high level of reliability and increase of inter-repair intervals, locomotive manufacturers use materials and technologies that increase the cost of the new locomotive. Thus, the requirement to reduce operating expenses, as a consequence, leads to an increase in the costs of buying new locomotives. One of the ways to solve this problem is the use of automated electronic systems of protection and diagnosis of locomotives. The availability of on-board technical diagnostic equipment at the locomotive allows controlling its technical condition and providing additional opportunities for improving the system of maintenance and repairs.

2. Purpose

On the base of existing researches analysis, devoted to the organization of maintenance and repair of locomotives, to propose the most rational option of the locomotive maintenance system equipped with on-board diagnostics systems. To determine objectives and technology of locomotive fleet management when implementing a