

DEVELOPMENT OF THE MODEL OF FIRE VEHICLE EXPLOITATION WITH DIESEL RECIPROCATING INTERNAL COMBUSTION ENGINE

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The relevance of the research topic lies in the fact that according to the results of the analysis of scientific and technical, reference, normative and patent literature, performed in [1] on the peculiarities of the process of exploitation of diesel reciprocating internal combustion engines (DRICE) and fire vehicles (FV), which are equipped with them, in addition, it is established that there are no models of exploitation of DRICE for FV, which are on the operational duty of the divisions of the SES of Ukraine. It was also found that there are more than 20 steady models of exploitation of DRICE of various types and purposes, the structure of which is the same.

Purpose of the study is to build the model of FV exploitation with DRICE, as well as the rationalization of its structure by a complex criteria-based assessment of fuel-ecological efficiency with taking into account the cost aspects of such process for such technical facilities.

In the study for the first time proposes the model of exploitation of the FV on the basis of the diagram of the distribution of operative duty and already known models. For the first time, the variants of the structure of the model of exploitation of the FV with the help of quantitative and qualitative analysis of the results of the calculated criteria-based assessment of the level of fuel-ecological efficiency of such a process are ranked. Also, for the first time, polynomials describing the main technical, economic and ecological performance of the autotractor diesel engine 2Ch10.5/12, as well as a complex fuel-ecological criterion and its components, across the field of its operating regimes by approximating the results of bench motor tests [2].

It should be noted that the developed model of exploitation of FV with DRICE allows to take more fully into account the specific features of such technical facilities in the calculated criteria-based assessment of the ES level of the studied process. Thus the quantitative and qualitative analysis of results of ranking of variants of structure of the developed model of exploitation allows to formulate the list of recommendations concerning administrative decisions in the field of civil protection. The obtained results of approximation of the basic technical, economic and ecological indicators of work of the autotractor diesel engine 2Ch10.5/12 on all field of its working regimes are suitable for use in any other settlement researches as a universal set of initial data [2].

References

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2. Kondratenko O.M. (2020) Selection of rational ecological safety structure of exploitation process model of emergency and rescue vehicle with reciprocating ICE. Materials of International Scientific and Practical Conference «Problems of emergency situation» (PES–2020), 20 May 2020, Kharkiv, Publ. NUCDU, pp. 363–365.