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SELECTION OF OBTAINING METHOD OF CRITERION'S INDIVIDUAL
REGIME VALUES OF ECOLOGICAL SAFETY LEVEL OF POWER
PLANTS WITH ENGINES EXPLOITATION PROCESS**

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Known approaches to the integrated criterion assessment of the environmental safety level of the accident-free exploitation process of power plants equipped with piston internal combustion engines, in their vast majority, require a single criterion value for the whole selected exploitation model of such installations, that is, a certain set of their operating modes. However, in assessing the effectiveness of implementing of measures to increase of the environmental safety level of a worded above process, the resulting effect may be unevenly distributed over the field of operating modes of such technical objects. Therefore, the significant interest of the scientific and technical kind is providing the possibility of obtaining the values of the selected criteria for each individual stationary representative operation mode of the engine, regardless of the parameters of the chosen model of its operation. The main problem in this case is obtaining the values of the criteria for the so-called "problem" modes – modes with zero (i.e. idle modes) and low magnitudes of effective power. For the first ones, some components of the criteria take uncertain values 0 and ∞ , for the second ones experimental obtaining of the set of output data components with acceptable accuracy on test benches without electronic control and regulation systems is not possible, and the values of the criteria are not informative.

In the study proposes four methods for obtaining the individual regime values of a complex fuel and ecological criterion and its components, which among the known ones is the most appropriate to the task of the criterial assessment of the environmental safety level of specified process. The "Non-zero idling" method, when idle modes are assigned non-zero small values of the engine effective power which consumed by the power plant to meet their own needs. The method of "Indicator components", when as the initial data used specific indicator indexes of the engine performance. The "Combined" method involves the use of individual regime values of the reduced specific effective mass emissions of legislative normalized pollutants and middle exploitation values of effective efficiency and a specific effective mass hourly fuel consumption of the engine. The method of "Excluded idling" involves the assignment of zero-mode modes of zero or negative values of fuel and ecological efficiency and non-consideration of idle modes when calculating the middle exploitation value of the criterion.

Carried out the computational comparative study of the first three methods of obtaining the individual regimes values of a complex fuel and ecological criterion and its components (the fourth methods is recognized as not corresponding to the purpose of the criterion assessment and was not investigated).

The research was carried out on the example of power plants equipped with an autotractor diesel engine 2Ch10.5 /12, which operates on a 13-mode stationary standardized test cycle.

The analysis of the results of the calculation study made it possible to conclude that it is unequivocally recommended to apply any of the investigated methods of obtaining the individual regime values of the selected criterion and its components, while simultaneously discarding others is impossible. Each method has certain advantages and significant drawbacks that are analyzed in the study.

Also, the results of the study allowed to determine the magnitude of the methodical error of all investigated methods, in function of which they was ranked according to the priority of application. It was determined that the least magnitude of methodical error is characterized the method of "Indicator components", the acceptable magnitude of methodical error is characterized the "Combined" method, and the "Non-zero idling" method has the greatest magnitude of methodical error.