CRITERIONAL JUSTIFICATION OF SELECTION OF RATIONAL NUMBER OF REGIMES IN MOTOR BENCH TESTS

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For qualitative and quantitative assessment of ecological safety level of exploitation process of power plants with reciprocating ICE it is rational to apply well-known criteria for mathematical apparatus which takes into account the widest range of ecological safety factors, for example, Harrington’s generalized desirability function *D*.

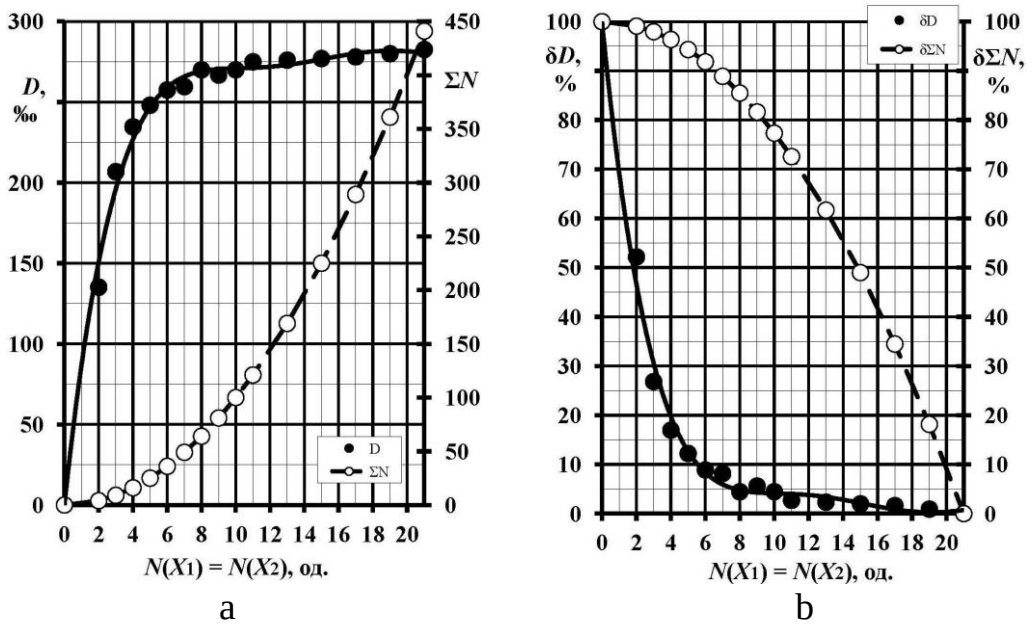
In this case as the initial data it is rational to apply results of bench motor researches of such engines on stationary testing cycles which are sets of discrete values. This raises the problem of the rational value of the number of levels of variation of coordinates of field of operational regimes of ICE.

It was proposed to assess this parameter by calculation way during rationalization of average exploitation values of selected criterion. It is advisable to select the value of relative methodical error and averaged cost of obtaining experimental data as rationalization parameters.

Analysis of results of such rationalization allows to determine that for predetermined limit level of relative methodical error that equals 5 % during motor bench tests of ICE it possible to limited by 8 levels of variation of coordinates of field of operational regimes of ICE which corresponds to 64 experimental points.

In this case the magnitude of averaged cost of obtaining experimental data in comparison with the base number of levels of variation that equals 21 (which corresponds to 441 experimental points) is decreases by 86 %.

This results illustrated on Fig. 1.



a b

Fig. 1 – Results of the calculation study for absolute (a) and relative (b) values