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Development of an integrated technology system design, safety control and diagnosis of complex technical objects under conditions of uncertainty and multifactorial risk

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3. **Results.**

      The methodological, mathematical and algorithmical toolkit on providing the control by functioning and monitoring, operative diagnosis, evaluation and prediction of the permissible risk margin of the forecast abnormal, critical, extraordinary, emergency and catastrophic situations' set in the complex technical systems' (CTS) functioning dynamics under the conditions of the uncertainties and multifactorial risks is worked out. The offered system strategy of the guaranteed safety of the CTS functioning is based on the input of the new methodology, axiom and the row of the hypotheses relatively the CTS functioning in the dynamics of the risk situations; the new principle to discover timely the reasons for the appearance of the abnormal situations, operative prevention for the transition of the normal situations to the abnormal, emergency or extraordinary, discovery of the risk factors, forecasting of the main object survivability indications in a flow of the set period of it exploitation as the base for the providing of the guaranteed safety in the CTS functioning.

      The system strategy is realized as the toolkit of the informational platform of the technical diagnostics (IPTD), provides the prevention of the uncapacity and the timely discovery of the abnormal object functioning situations on the base of the operative diagnosis, the system evaluation and the forecasting of the multifactorial risks' dynamics. By complex, system and continuous evaluation of the parameters of the object functioning in the real time mode there are discovered the situations, which can lead to output of the object out the functioning limits in the normal mode. The simultaneous accompaniment and integrated evaluation of the indications of the eventual number of the functionally dynamical parameters allows to carry out in detail the processes of the functioning of the object for the any complexity.

      For the situations, which development leads to the possible parameter rejections from the normal mode of the object functioning, it is possible the timely to take the decision about the changing of the object functioning mode or artificial correcting of the parameter row with the goal to provide it functioning surviability. The principles, which put to realize the strategy of the guaranteed safety of CTS functioning, provide the flexible approach to the timely discovery, recognition, forecasting and system diagnosis of the risk factors and risk situations, forming and realization of the rational decision for practically acceptable time in the limits of the irremovable time restriction.

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