Reliability analysis of some complex systems with time redundancy

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In the process of elaboration of the mathematical models in the reliability theory, a wide class of random processes is used: Markovian processes, semi-Markovian processes, regeneration processes, etc ([1]).

At the same time, the traditional methods for determining the reliability characteristics of the systems are based on the assumption of the exponential distribution of the random variables that participate in formalization of the systems [2]. However, in most cases, this assumption is not confirmed by real data, thus elaboration of the methods, that allow the reliability analysis of complex systems in general conditions regarding the initial distribution, remains an actual problem of the reliability theory.

At the beginning of the 80's, in [3] a new analytical method for calculation and estimation of the stationary characteristics of reliability of the complex systems with restoration was developed, which does not require the assumption of the exponential distribution of the random variables that participate in formalization of the systems. The effectiveness of this method was demonstrated in [4; 5] where the reliability analysis of some systems, which could not be studied with classical methods, was performed. The generalization of this method for semi-Markovian systems with complex structure with restoration and discon-nection of elements [4] for the systems with time redundancy will be presented.

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