

## Methods for determining reliability of complex systems

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The contribution deals with the determination of the final reliability function, the mean time to failure and the hazard rate of complex systems. These systems cannot be simplified to a combination of series and parallel connected blocks [1]. The systems were set by using a reliability block diagrams [2]. Each block represents an element of the system, the connections between these elements are set by lines. Ties connections might be one-way or double-way, what is shown by the arrows. The aim of the contribution is to determine the reliability function of the complex system on the model example. Three methods were used to determine the reliability function: the method of minimum paths, the method of critical sections and the decomposition method. The Matlab program was used for calculations. The article presents the basic principles of individual methods and the functional relationships used to determine reliability function of the systems [3]. Virtual block diagrams of the respective system are also shown for all three methods. In terms of calculation efficiency, the decomposition method seems to be the most suitable. It is not necessary to apply the idempotence transformation because neither of elements of the system is repeated in virtual models more than once. In the methods of minimal paths and critical sections, it is necessary to apply the idempotence transformation, because some elements of the system can be found more than once in virtual models.

*This work was supported by Projekt No. 035STU-4/2024.*

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