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### **Methods of Measuring Information Security Risks**

More and more often in life we face with the problem of risk in different spheres. The ways to resist the sources of risk are established methods and methodologies for risk measurement.

The quantitative evaluation of the likelihood and consequences (or the distribution of random variables, with the help of which the risk situation is simulated) can be performed using various methods. The choice of method depends primarily on the amount of available information, including statistics, about the risks and the required precision of the estimates. It is also necessary to consider the actual level of risk. The less the probability of occurrence, the harder it is to measure the risk. The general principle to choose the methods of measurement is to maximize the use of available statistical data. If it is not available, insufficient or inapplicable, the actual material is replaced by a theoretical hypotheses or expert estimates.

We can distinguish four groups of methods of quantitative risk assessment: statistical methods; probabilistic-statistical; theory of probability; and expert.

The basis of these methods is the assessment of probability of the occurrence of the accidental events based on the relative frequency of occurrences of this event in the series of observations. These methods are the most preferable, because, firstly, they are quite simple, and, secondly, their estimates are based on actual data (and, the practice, as it is known, is the criterion of truth). However, statistical methods are not applicable where there is enough volume of observations. The correct evaluation of the risks of rare events requires a very large volume of statistical data. Besides, the collection and processing of such data arrays may be too long and expensive. However, managing risks we face the necessity of evaluation of rare events, which can have very serious consequences. In the past these events could never happened because of their "rarities" or the uniqueness of the considered objects. In this case the statistics can't exist, or can relate to other objects, which are considerably different from the subject. This makes impossible the application of statistical and probabilistic and statistical methods. We have to use theoretical and probabilistic methods, which are based on constructing a mathematical model of the investigated risk and theoretical estimation of its parameters. These methods are very complicated and have relatively low accuracy, but in some cases they are the only possible evidence-based way of assessment. In particular, they are used in the development of declarations of industrial safety of the enterprises.

The features of the considered methods of quantitative risk assessment determine the sphere of their application depending on the available statistical data and the possibility of constructing theoretical models.