Problems of the Decision Making on the Basis of Measurement Information

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The requirements to quality of measurement results are formulated in accordance with the aim of a measurement, which is caused by the further usage of the measurement result. A measurement task is always a part of a more general task of a decision making. This task is of a metrological character, for an example, verification and checking of measurement instruments or it can come from applied investigations being carried out in such fields of human activity as ecology, medicine, trade, economics and so on. Among these are the control of environmental parameters, products quality, control and management of technological processes, development of complex information and measurement systems and others. Quite often the measurement task can be set apart from the general one and their relationship revealed only on the preliminary stage of the measurement procedure, when the object under investigation, the measurand and requirements to the measurement accuracy are being determined. But in a number of cases, such approach can not be applied because the requirements to accuracy as well as the criteria for decision making depend on the value of the measurand. As an example, the development and metrological assurance of intelligent measuring instruments need just a complex approach to the quality estimation of decision making. This approach should be based on:

- Adequate application of the methods of math statistics, namely the theory of statistical decisions,
- Further development of the general theory of measurement procedures.

Elements of the mathematical task of decision making are analyzed. The above statements are revealed as applied to concrete tasks of decision making: quantitative estimation, hypotheses testing, multiple decisions.