

Some ways of resolution of current environmental problems

Editorial

Technological progress brought the civilization to the emergence of numerous artificial factors, the influence of which on the environment becomes in all perceptible. This stipulates the quantitative and qualitative change in the environment. In this connection, there arises an actual problem of studying and analyzing the current situation with the purpose of elaboration of the principles and facilities of saving the environment in the suitable condition of living. It is necessary to have adequate information about the quality of the environment for its study, analysis and management. The environment is characterized by an enormous number of physical, chemical and biological parameters. A lot of measurements are to be carried out for permanent control of these parameters. Therefore, the solution of the problems of control and management of the quality of the environment can be realized only by using automated, continuously operating pollution analyzers and automated environment control systems. The purpose of such systems consists in operative reduction of the environmental pollution based on continuous monitoring and prognosis of pollutants, by operative organizational-technical measures, and optimal planning of long-term environment protection measures, by rational distribution of available means for each object in the case of their limited quantity. Designing of such systems is associated with the solution of complex problems of development of new methods and facilities of control and management of the quality of the environment on the basis of systems approach methodology with a wide use of modern methods of mathematics, cybernetics, modeling, information-measurement and computer techniques.

Effective application of new methods and facilities for designing of control and management systems is hindered by the shortage of systematic materials in the area of applied research of the processes of control, estimation and prognosis of their conditions. For resolution of practical problems of environment protection, at the first stage there are promoted the issues concerning the measurement and control of physical quantities that characterize the current state of the environment, and the improvement of the authenticity of the information obtained by environment quality analyzers. The measurement data of automated measuring devices for controlling the quality of the environment contain "noise". Along with reliable information, they contain inaccurate one. This distorts the identity of the decision about the state of the environment. Appropriate processing of this information is necessary for filtration of the measurement data and making the optimal decision about the current and perspective state of the environment. Working out of common methodology of the development of various aspects of automated environment control systems such as systems, technical, informational, metrological, program, and mathematical ones is a quite topical problem.

The automated environment control systems are used for operative control and making decisions about the state of controlled objects. The decision-making theory is one of the most developed in modern mathematical statistics. However, despite of deep study of the problems

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of decision-making in general, the development of new methods with consideration of the specific features of the information-measurement systems for controlling the environment remains problematic. The theory of mathematical modeling formed as an independent branch of the modern applied mathematics in the fifties of the last century. Its possibilities increased practically unbounded for the solution of complex scientific-technical problems with the development of computer techniques. The development of the practical models of pollution processes of the environment allowing their use in automated systems, for the system solution, environment protection, technical and metrological problems, is topical. Modeling opens wide possibilities for designing of analytical measurement systems. It allows us to make this process automated with consideration of the technical and metrological characteristics of measuring means. Therefore, the works containing the general principles of modeling, working models of analytical measuring devices and their practical use is also topical. On the basis of the foregoing, we think that the works dedicated to the solution of the mentioned problems at the proper level is very important and are welcomed in the journal.

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