

# NEW INFORMATION INTELLIGENT MONITORING TECHNOLOGY FOR COMPLEX TECHNICAL OBJECTS UNDER DYNAMIC CONDITIONS IN REAL TIME

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Many complex technical objects (CTO), such as Aircraft and Space Launch Vehicles, are remotely monitored and controlled. Operators (dispatchers) receive information about current CTO states in a form of telemetry. Complication of modern technical objects is resulted in expansion of their parameters to be measured and controlled. Today the number of such parameters can achieve several hundreds or thousands for various classes of technical systems. Usually CTO state monitoring is not automatized completely. Thus, operators receive semantic information about some elements of CTO rather than information characterizing integral CTO state. To estimate CTO state the operators should be able to analyze various context conditions of interaction between CTO elements and subsystems. Existing program systems for gathering, processing, and analysis of CTO telemetry usually depend on characteristics of particular control objects and is not adaptable to undesired alteration of objects' structure. The methods and tools for construction of monitoring algorithms and systems are very specific and can be used in narrow domains.

Unlike this approach, the new information intelligent monitoring technology (IMT) considered provides integrated use of the accessible information of complex objects states and about a critical situation and its predictable consequences.

The main possibilities of the IMT are shown below:

- The real-time processing of a considerable quantity of diverse parameters;
- The data and knowledge simultaneous processing;
- The intelligent analysis providing of the measuring information of any physical nature on the distributed computer complexes;
- The results visualization of the processing in a 2D and 3D format, the interface with geoinformation systems implementation;
- The ability for creation of concrete monitoring systems for non-professional users (non-programmers).

The IMT developed is based on interdisciplinary methodology of creation and application of any information technology. Besides, it lets consider functioning dynamics and possible structure degradation of complex objects in critical situations, and operate structural dynamics of complex objects. Unlike existing systems, the IMT is universal, it includes the combined methods and algorithms of decision making in various classes of monitoring problems, forecasting and safety control of CTO regardless to their appointment.

Now IMT is successfully implemented for monitoring of Space Launch Vehicles in Russia and in Guiana Space Centre (Centre Spatial Guyanais, Kourou).