

CONSIDERATIONS ON OPERATING TECHNICAL SYSTEMS

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Abstract: A technical system displays a specific working capability. This can be damaged as a result of failure or a failure condition that contributes to reducing technical or economic performance. It is important that a mathematical model for characterizing the operating status at a given time in the life of the technical system to be found. The present paper is an attempt to establish the size of the ability to operate at a given moment in a normal period of operation.

Keywords: technical system, function, operating status, calculation the working capability.

1. Concept of functionality and condition of failure

The *functionality* concept or *the capacity to function* defines the status in which a technical system (ST) carries out the functions within the limits set by the technical and economical documentation. After a while, in any ST changes take place and they cause a decrease in the output parameters (characteristics required). The energy of the technical systems in the execution process, determines physical and chemical processes, which lead to wear, destruction by breakage, corrosion and damage. This energy determines changes in the technical characteristics required, including the loss of the system's working capacity. For example, the charge/load in the joints a machine tool leads to its wearing and deviation from the original form of the assembly; therefore, the accuracy of the machine decreases, that is, one of the basic features.

The work rejections cause serious disturbances in the function of a ST. The criteria to assess a ST's ability to operate (1) are: *resistance, rigidity, wear resistance, vibration resistance, heat resistance*, etc.

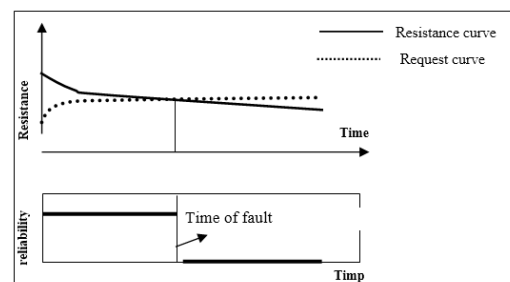


Figure 1. Changes in the operating status

But, during working possible faults may appear, fig.1, which can cause a change in the operation or existence of technical systems. In terms of quality, the fault is defined as a *non-compliance to the conditions established for one or more of its characteristics*. It also can be used to define the *fault condition as a termination of proficiency of a product to meet the function specified*.

In a real technical system, the products are defined as sums of subsystems of perfect objects with different characteristics. The critical resistance of an object is given by its weakest link [2]. The evolution of a fault, in time, is particularly important for the development of a ST. From the point of view of reliability, the resistance of a real object will be greater than the loading only for a period of time, due to lowering its resistance through the