

**ASSESSMENT OF TECHNOLOGICAL LEVEL OF REPAIR
ENTERPRISES**

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The enterprise for the repair of machine and tractor fleet is a system of technological means of production that works in a dynamic environment with changing conditions and types of products - repair of mobile machines and their elements in field and stationary conditions, equipment of livestock farms, restoration and manufacture of parts, provision of other services of a technical and technological nature [1]. This achieves the extension of the life cycle of machines and their elements by restoring operability after failure.

It is known that there are no exact rules that allow building a system of technological means of service on the basis of inviolable laws and rules. Therefore, the search for an adequate assessment of the technological level of a repair enterprise is carried out with the help of informal considerations, analogies, intuition, experience.

The machine-tractor park repair enterprise is presented as a relatively isolated system (Fig. 1), where under the influence of input influences its state (technological level) changes and as a result material resources appear that remain inside the system or leave it in the form of output influences, i.e. go into the external environment [1].

In order to imagine the repair enterprise as a system, it is necessary to dismember it, to identify spatially limited parts, to ascertain the existence of relationships of these parts in the integral picture of agrotechnical service [2]. In these works, the model for evaluating the technological level of enterprises is based on the study of factors characterizing various technological properties of repair and service workshops in the process of carrying out repair work. It will allow a systematic approach to increase the technological level of repair enterprises and the development of specific organizational and technical measures to increase it.

The technological level of repair workshops is determined by a set of indicators of technological preparation of production (TPP), and as a type of production activity of the enterprise is interconnected with the stages of the life cycle of manufactured repair products [1, 2].

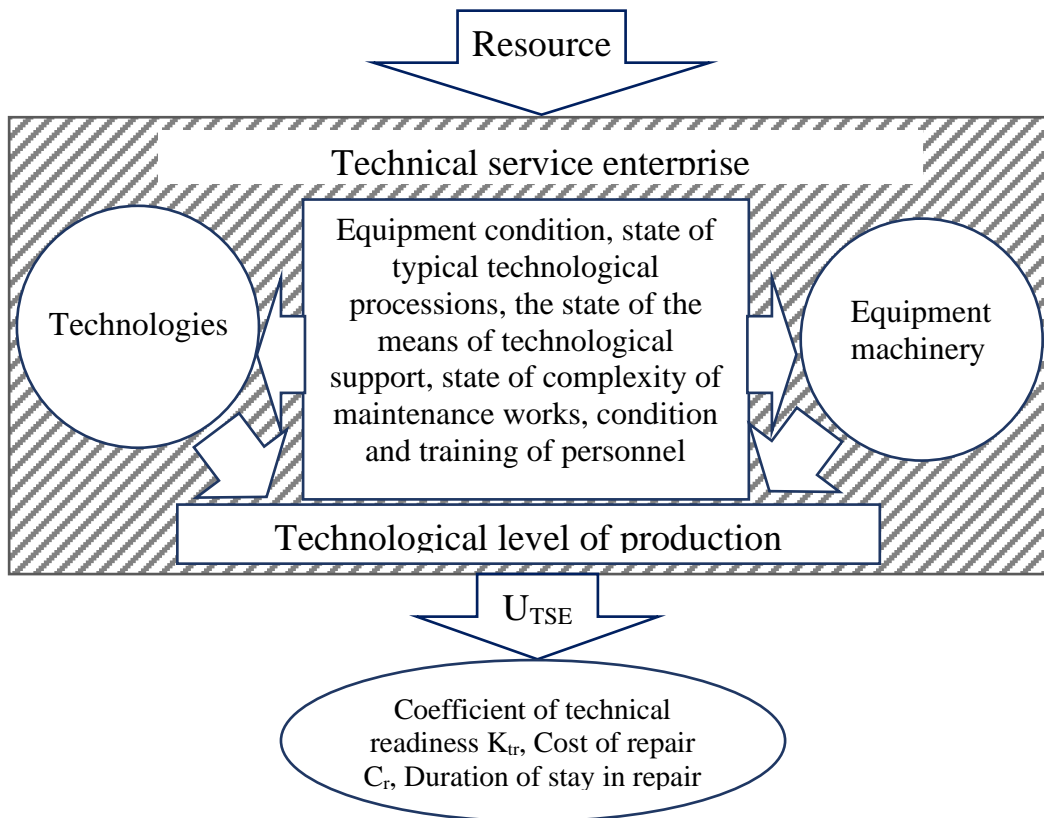


Fig. 1. System representation of machine and tractor park (MTP) technical service

Considering the structural diagram of the influence of factors in the form of a "black box" shown in (Fig. 2), as one of the main concepts of cybernetics, it is possible to imagine the entire process of the operation of the enterprise in the form of a functional converter with input and output variables [1].

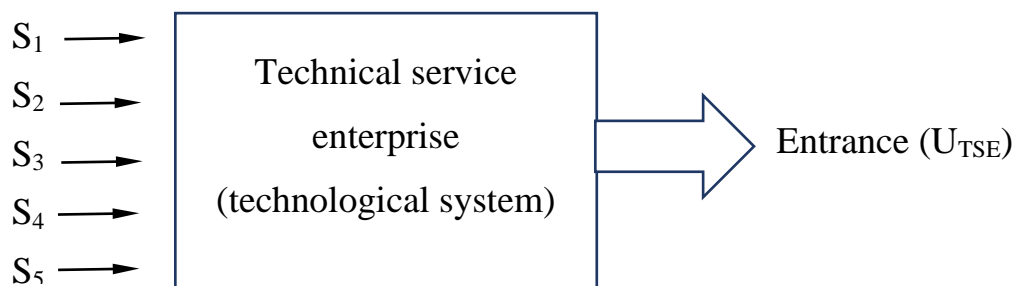


Fig. 2. Model of a comprehensive study of the technological level of a repair workshop

Components of input generalized indicators S_1, S_2, S_3, S_4, S_5 , respectively: state of equipment; state of technological processes; state of technological support means; the state of complexity of the works in terms of technical service and repair (TSR); the state and training of personnel, which affect the system, characterize the properties of the technological state of the system and determine the formation of qualitative and quantitative indicators of its efficiency, that is, the initial indicators of the

system (U_{TSE}) [2].

With regard to agrotechnical service, this means that the quality of agricultural machinery repair depends on how fully provided the technological preparation of production is and, therefore, how high the technological level of the repair enterprise is, which can be assessed by the system of quantitative assessment of the technological level [2, 3]. The analysis of works [4, 5] made it possible to identify five generalized indicators of the technological level of repair enterprises, which have a hierarchical arrangement in the form of a tree of goals (Fig. 3).

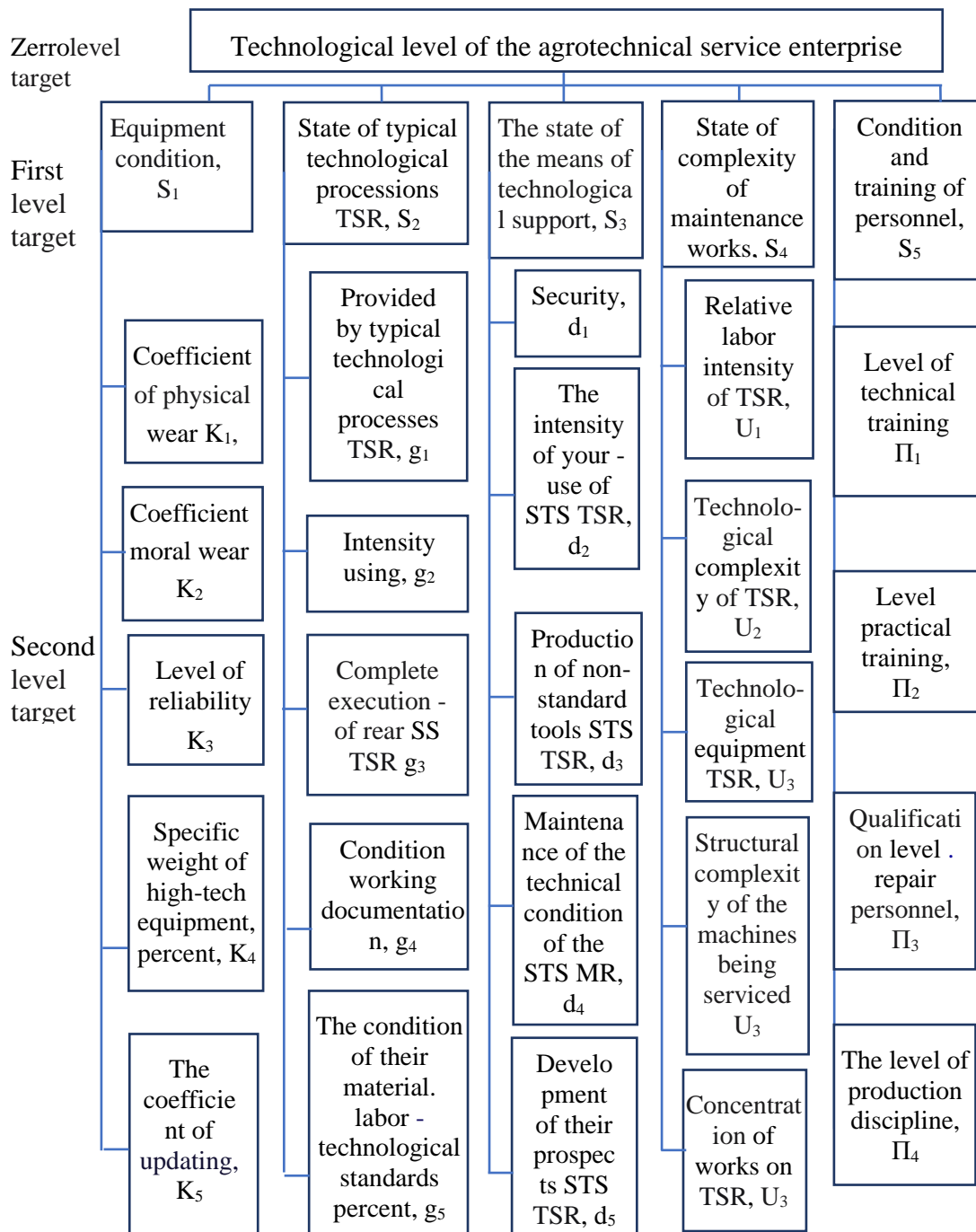


Fig. 3. Technological level indicators of repair enterprises

Indicators S_1, S_2, S_3, S_4, S_5 are generalized indicators of the

technological level and quantitatively characterize the purpose of the first level.

In its turn, in a general form, each of the generalized indicators of the technological level can be presented in the form of functional dependence on the indicators of the state of repair and technological and machine tool equipment (k), indicators of the state of typical technological processes of repair and maintenance (g), indicators of the state of technological equipment funds (d), indicators of the complexity of maintenance and repair work (u), indicators of the state and training of personnel (n).

The complex indicator (U_{TSE}) of the assessment of the technological level of the repair enterprise is determined by the expression:

$$U_{TSE} = F(S_1, S_2, S_3, S_4, S_5) \rightarrow \max \quad (1)$$

where S_i – is the generalized indicator of the technological level of the repair enterprise, $i = 1, 2, 3, 4, 5$.

The parameters of the state of the repair workshop, which determine its efficiency in combination with external factors and the connections between them, are system-forming factors of the technological level.

A comprehensive assessment of the technological level of repair workshops is necessary for aggregating, formalizing and clarifying the activities of the repair enterprise and developing a set of measures that will later form the basis of the process of improving the enterprise's activities when applying the aggregate repair method.

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