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OF A PRODUCTION RESERVES DEFICIT****Е.С. Балашова****МЕТОДЫ, КОМПЕНСИРУЮЩИЕ
ДЕФИЦИТ РЕЗЕРВОВ ПРОИЗВОДСТВА**

The article focuses on the urgent problems of resource management; a classification of the production reserves is provided. Special attention is devoted to the modern methods of resource management, allowing to identify and optimize production reserves.

RESOURCES. MANAGEMENT. PRODUCTION RESERVES. ORGANIZATIONAL TECHNOLOGY. LEAN PRODUCTION. KAIZEN.

Рассматривается проблематика ресурсного менеджмента, его актуальность, дана классификация резервов производства. Особое внимание уделяется современным методам ресурсного менеджмента, позволяющим выявить и оптимизировать производственные резервы.

РЕСУРСЫ. МЕНЕДЖМЕНТ. РЕЗЕРВЫ ПРОИЗВОДСТВА. ОРГАНИЗАЦИОННЫЕ ТЕХНОЛОГИИ. БЕРЕЖЛИВОЕ ПРОИЗВОДСТВО. КАЙДЗЕН.

The global economy is constantly and continuously changing, thus establishing the new requirements of successful operation of businesses. Industrial enterprises are in a particularly difficult situation because the basic criterion for the efficiency of the production systems is currently formulated as «manufacturing of products of the highest quality at the lowest cost» [5]. Such a statement of the problem is based on a high and ever-increasing level of competition among manufacturers, openness of the markets at the macroeconomic level, availability of substitutes of the manufactured products, from the consumers' point of view, in terms of satisfaction of the emerging basic needs.

The unused and constantly emerging opportunities for growth and perfection of production, improvement of its ultimate results (increased production and sales of products, reduction of production costs, growth of profits are the internal production reserves of industrial enterprises (Fig. 1) [4, 9, 11, 12]. Production reserves are characterized by the inconsistency between a current use of the production resources and a much higher potential of production resources in case losses and wasteful expenditure are eliminated, and scientific achievements and technical progress are applied.

The formation of the production reserves is a continuous process, as it is related to scientific and technical progress, and the improvement of the organization of labor and management [7]. Production reserves must be distinguished from the losses resulting from malfunctions, deviation from the established operating practices, and violation of technological discipline. While analyzing and identifying the reserves, the researchers should primarily clarify the analyzed level or the basis of comparison.

The goal of the reserves selection is to increase production and sales rates, achieving the level of profitability that is high enough to hold the competitive positions and to increase the company value. Search and evaluation of the reserves implies quantitative modification of the potential production growth as a result of more efficient use of the resources and optimal combination thereof, as well as increased market presence of the organization.

Use of the lean production model as a tool for identifying the production reserves and for related optimization of the operational activity, represents a breakthrough approach to management and administration of the industrial enterprises, maintenance of its long-term competitiveness without significant capital investment.

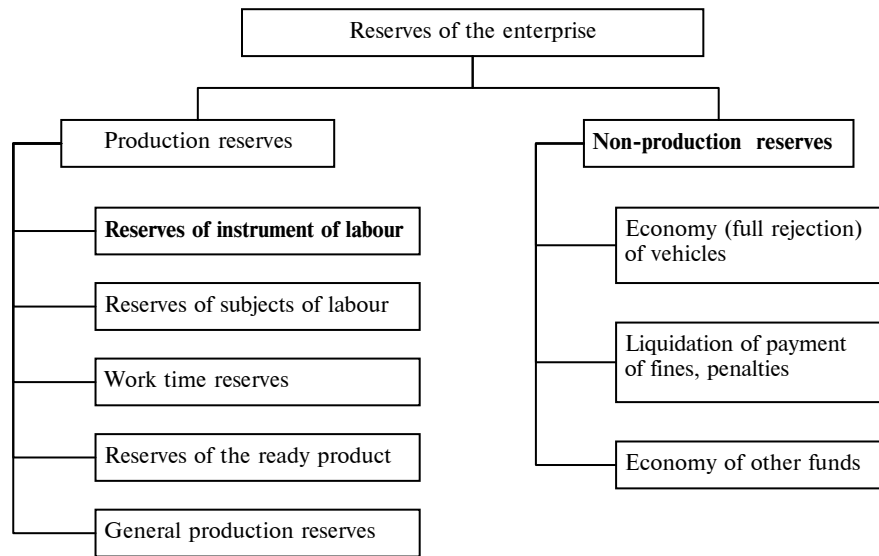


Fig. 1. Typology of enterprise' reserves

According to the results of statistical studies and sociological opinion polls, penetration of the elements of Japanese lean production system into the Russian industry is rather sound – about 30 % [3]. The concept of lean production includes optimization of the production processes, in order to achieve simultaneous cost reduction of the company's basic products, and to improve their quality. Dependence between the product cost and its quality has been traditionally considered as direct dependence, i. e. high quality product, as it was assumed above, cannot be cheap for the manufacturer. The concept of lean production represents the product price/quality dependence rather differently. Quality product is a product during the manufacture of which the production loss level as low as possible. Thus, the set goal becomes quite attainable. However, introduction of such a basic and simple, at first glance, concept is actually a complex managerial, organizational, and communication process. The problem is that the Lean production concept has been developed and initially applied in the automotive business. The basic models and methods of lean production must be established in view of specificity of the business operation and should be adapted to the latest demands. For the major sectors of public economy, the adaptation of lean production model has only just begun.

The relevance of the application of the lean production model in Russia has been appreciated at the governmental level. At a meeting of the Modernization Commission, President of the

Russian Federation noted that, in order to improve the competitiveness of the national enterprises and their performance efficiency, it is essential to be engaged in the **development of production systems**. In this sense, he seemed to have much concern in the concept of «**lean production and economic thinking**», and he believes that Kaizen philosophy of continuous improvement is just a «godsend»:.. *total exclusion of losses – all that does not add value to the end product – is the top issue now. These losses are at the bottom of actual reasons for the low productivity and low efficiency of the domestic enterprises...* «

The Government of the Russian Federation has ordered to consider, in the nearest future, the possibility of the domestic enterprises to apply advanced production organization methods. The lean technologies and ideas of operational excellence themselves are important enough to be included in the compulsory curriculums of the universities and post-secondary educational institutions.

The concept of lean production is gaining much popularity in Russia. Many manufacturers are committed to cost reduction, increase in productivity and the improvement of quality. Lean production corresponds to the process model of management of an industrial enterprise, so that it is traditionally represented as a process that consists of the following five stages of implementation [6]:

- definition of the consumer value,
- making the consistent value stream,

- ensuring the stream continuity,
- ensuring it to be customer-oriented,
- constant commitment to excellence,

The concept of lean production was changing historically, gradually transforming into the idea of a lean enterprise. This is quite natural, since production is directly related to non-productive service agencies and, if production is in good order, but the rest of the organization lies in total anarchy, lean production will be of no use at all.

The functional goal of each component of lean production is to achieve its own target, while an interaction of components facilitates the main purpose of the production system: maximizing the product quality and minimizing the production costs.

The functional goals of the components of lean production are based on the essence of the major tasks thereof.

The process of continuous improvement (kaizen) represents one of the basic organizational techniques in modern business. The basic purpose of kaizen is improving performance through the company's internal resources.

The set goal is conventionally divided into the three main components:

- Improvement of the finished product quality;
- Cost reduction of each product;
- Delivery on «just-in-time» basis.

The 5S System represents the technology of work space organization aimed at in improvement of labor productivity. The purpose of 5S is the formation and maintenance of the working order in the process of added value creation. The 5S system implies achievement of the following production goals:

- Strategic: increase in labor productivity: reduction of spoilage rate;
- Tactical: identification and elimination of deviations from the normal operation, elimination and exclusion of malfunctions, improved labor safety.

Detecting the sources of manufacturing defects Global 8D is the process of systematic problem solving, which consists of 8 stages (tasks) functioning at the same time and determining the key reasons behind the problem, thus preventing its reoccurrence [10]. The main purpose of G8D is to find the place and the reason behind the production problem (failure, malfunction, defect, non-conformity), its elimination and preventive improvement of the

production system, in order to exclude its reoccurrence in the future operations.

An important facility for production processes improvement is the Statistical Process Control (SPC). Statistical process control implies monitoring the condition of the processes through measuring some of the parameters of the manufactured products or manufacturing processes. The purpose of SPC is a gradual relinquishment of production quality control to be replaced by process quality control, which may ensure the elimination the systemic failures of the production system until the occurrence thereof, and ensure stability and reproducibility of the production behavior.

FMEA (Failure Mode and Effects Analysis) represents analysis of the types and post-effects of failures. FMEA is a methodology for the analysis and identification of the most critical steps, for the purpose of quality control. The purpose of FMEA is to analyze all possible system errors and determine their results or effects on the system, in order to classify all the errors in terms of their criticality for the system's operation.

TPM (Total Productive Maintenance) is servicing of the equipment, allowing for achievement of its maximum efficiency over the entire life cycle involving all the staff. The purpose of TPM is to create an enterprise which will be constantly striving to the utmost and comprehensive improvement of the production system efficiency. To achieve the above goal, a system focused on the prevention of any types of losses must be introduced («no accidents», «no damages», «no defects») throughout the entire life cycle of the production system.

JIT (Just In Time) represents a method of company inventory management, which has been designed to improve return on investments, efficiency and quality of work through drastic reduction of the inventory level [1]. A consistent application of JIT allows to achieve the following main objectives of an enterprise: simplification of warehouse material flows, synchronization thereof with the production schedule, reduction of inventory storage-related costs.

Kanban (Smart Card) represents a planning system which allows to determine what, when and how much shall be produced. This is an appropriate element of the JIT concept introduction. Kanban is used as an indicator of demand, immediately transmitting the signal over

the entire supply chain. It represents the «pulling» system which is guided by demand in the extreme right point of the supply chain. The main goal is to produce just the necessary volume of products within strictly defined period of time, in order to reduce the time of keeping the product at each production site and in a warehouse, thus using the time of production and delivery to the consumer as a competitive advantage. The application of the Kanban system regulates the quantity of goods produced at an enterprise [2]. Kanban is called a signaling system of lean production, because it controls the production as skillfully as the brain and the nervous system (the first signaling system) do to the human body. The main advantage of Kanban is to prevent overproduction. The purpose of Kanban system is to produce only the desired products in the required quantity and at the right time. In Japanese, the word «kanban» means «tag» or «mark».

The application of the WG Model (Working Group) – Model of Working Groups (WG) implies a permanent creation of the cross-functional teams of company employees, to achieve fast implementation of the internal corporate goals. Such goals can be either of scientific-research nature and imply development or introduction of the new intracompany projects. Workgroups operate within the predetermined time interval from few weeks to several years. Upon the termination of the specified time or achievement of the set goal, they are dissolved. The objectives of the working groups are:

- creation of the reference document, technique;
- establishing the intracompany standards;
- solving the system or network related problems;
- continuous improvement of the production processes.

TQM – Total quality management is the philosophy of comprehensive quality management, which has been successfully launched many years ago in Japan and the USA, upon the introduction of the initiative of giving awards to the companies that have achieved the highest product quality [8]. The main idea of TQM is that the company must focus not only on product quality, but also on quality of the organization of work, including the work of the staff. TQM implies permanent parallel improvement of the 3 components thereof:

- product quality;

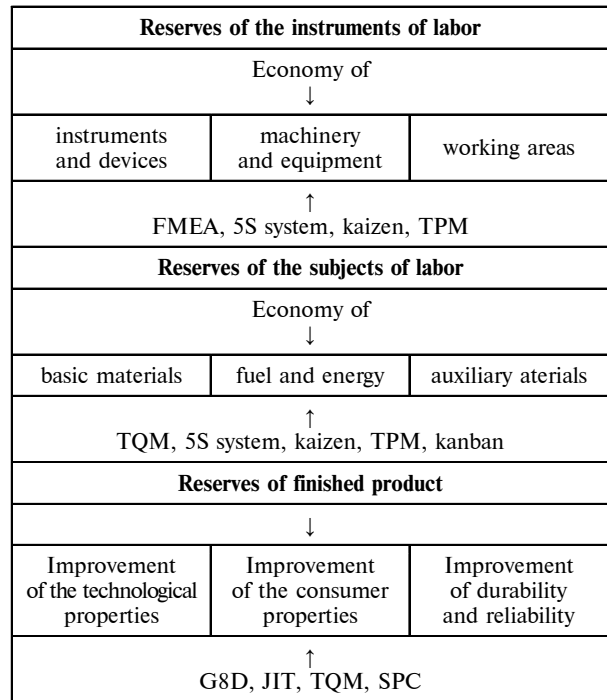


Fig. 2. Management of the reserves of labor instruments, subjects of labor and finished product

- quality of processes organization;
- staff qualification level.

Quality is defined by the following categories:

- meeting the customers' requirements
- growth of the company's financial effectiveness
- increase in the company's employees' job satisfaction

The compensation of the internal production reserves is achieved through the implementation of the functional goals of lean production, thus it should be taken into account that the utmost efficiency of the production system can be achieved subject to simultaneous implementation thereof.

Reserves of labor instruments are formed due to application of the policy of saving fixed production assets (Fig. 2). The classical concept of such a strategy would inevitably lead to the decline in the quality or productivity of the main production processes; the application of the lean production instruments allows to minimize the potential adverse effects while achieving clear competitive advantages. Similar trends are observed in the identification and compensation of the subjects of labor and the finished product.

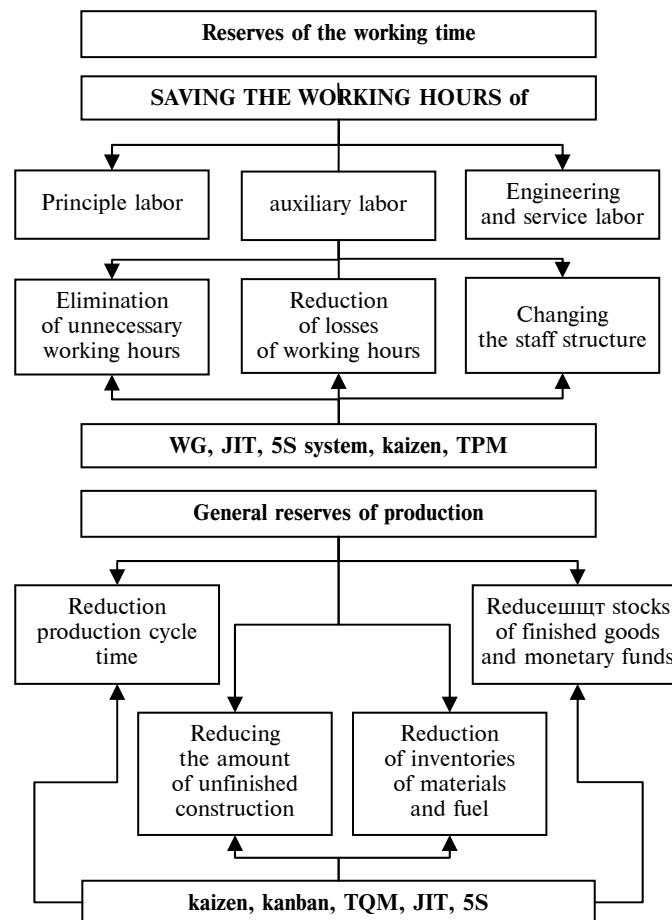


Fig. 3. Management of the working time reserves, general production reserves

General production reserves (Fig. 3) which are understood as the reserves related to the organization of the production process, are formed on the basis of applied organizational and production technologies. Their identification and compensation constitute a component of corporate strategy based on the introduction of such models as kaizen, kanban, TQM, JIT, and 5S.

The mobilization of reserves allows to increase production considerably with minimal investments involved (capital investment) and minimal additional consumption of materials, fuel and energy. It ensures significant savings of public labor, improvement of its productivity, decrease in production, and growth of internal production savings. The mobilization of production reserves is the most economical source of industrial production growth.

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