ON IMPROVEMENT OF PLANNING OF STOCKS OF MATERIAL AND TECHNICAL RESOURCES

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ABSTRACT

The relevance of the article is justified by the need for in-depth theoretical and applied research related to creation of an integrated system for planning and controlling of resources, improvement of the material and technical supply of railway enterprises. The object and area of research is the subsystem of material-technical supply at the operating domain of Kuibyshev Railway in the system of economic management of JSC Russian Railways. At the same time, the improved methodology for calculating the standard of production stocks is demonstrated, which excludes unreasonable decentralized purchases, reduces maintenance of inventories, operational costs of accompanying supplies of material assets, as well as operational, depreciation and tax expenses of the regional departments of Samara Directorate of Material-Technical Supply.

Keywords: railway, material and technical supply, planning, methodology for calculating the standard of production stocks, intra-industry reserves, spending limits, economic efficiency.

Background. *The purpose of the system of material and technical supply of the enterprise is to timely and fully meet the needs of its units in achieving economic stability, stable functioning of economic and production processes [1].*

To ensure the smooth operation of railways in certain sectors of the economy (track, electrification, locomotive, etc.), emergency recovery stocks are created. Departments of JSC Russian Railways, taking into account the specifics of the activities of the sectoral economies, can also form other types of reserves: kilometer-based, technological, irreversible, etc.

The sum of all stocks cannot exceed the standard of the production stock.

In determining the standards of production stocks, various calculation algorithms are used, depending on the form of supply, the category of reserves, the level of their aggregation (enterprise, road, directorate, etc.).

Responsibility and control over observance of established standards of production reserves are borne by the heads of departments at all levels of management. For the analysis of the situation, the data of operational accounting and financial statements are used.

Objective. *The objective of the authors is to consider the method for improvement of planning in terms of stock of material and technical resources.*

Methods. *The authors use general scientific methods, mathematical calculations, economic methods, comparative analysis.*

Results.

I.

The current level of stocks PS_{cl}, expressed in months of their production consumption, is calculated by the formula:

$$PS_{cl} = \frac{PS_{ep} - ES}{C_{mtr}}, \quad (1)$$

where PS_{ep} – the amount of stocks on the road (branch, enterprise) at the end of the reporting period (taken under form No. 1 «Balance Sheet», Section II «Current Assets», line 211 «Raw materials, materials and other similar values»); ES – emergency-recovery, technological stocks; C_{mtr} – average monthly consumption of material resources (fuel and materials) in the reporting period [5].

It should be noted that the methodology for calculating the standard of production stocks, approved by the order of the management of JSC Russian Railways dated 05.10.2006 No. 2007r, turned out to be not quite effective in practice [3]. The planned value of stocks of material and technical resources (MS) in value terms is determined by the budget of the directorate for the planned period based on the control parameters:

$$MS = PS + CTS, \quad (2)$$

where PS – production stocks of material and technical resources intended for use in the performance of the planned scope of work; CTS – certain types of stocks to ensure normal operation when certain events occur that could lead to disruption of the program [3].

Planning of production stocks is based on the planned costs for the elements «materials» and «fuel» and the approved norm of stocks.

The annual indicator is calculated by the formula:

$$PS = LPS \cdot MF, \quad (3)$$

where LPS – level of stocks expressed in months (days) of their production consumption (determined by the control parameters of the annual budget for the central directorate of infrastructure and differentiated across all structural subdivisions); MF – average monthly (average daily) consumption of materials and fuel, calculated on the basis of the amount approved by the annual budget for the items «materials» and «fuel».

In value terms, PS are reflected in the budget for stocks and purchases as an indicator of the «stocks standard for the production process». During the year, the value of PS may change only if the annual budget is adjusted for the cost of materials and fuel [3].

Improvement of the methodology for calculating the standard of production stocks implies the division of the total indicator into two separately monitored indicators:

a) PS_n – production stocks with new material values, calculated under the formula:

$$PS_n = LPS \cdot MF_n, \quad (4)$$

where MF_n – average monthly (average daily) consumption of materials and fuel based on the amount of expenditures for new purchases approved by the annual budget for the elements «materials» and «fuel»;

b) PS_{old} – production stocks created by old material values:

$$Ps_{old} = LPS \cdot MF_{old}, \quad (5)$$

where MF_{old} – average monthly (average daily) consumption of re-use materials (old), calculated on the basis of the amount approved by the annual budget for writing off reusable materials for the element «materials».

The generalized standard of production stocks is found by the formula:

$$PS_{gen} = PS_n + PS_{old}, \quad (6)$$

where PS_{gen} – generalized standard of production stocks.

Calculation of the standard of production stocks using the example of Kuibyshev Infrastructure Directorate according to the 2013 budget without taking into account the proposed changes:

PS = LPS · MF = 1,5 moths (45 days) · 1825 mln rub. / 12 (365 days) = 228 mln rub.

Calculation of the standard of production stocks for materials purchased by new values, taking into account the proposed changes:

PS_n = LPS · MF_n = 1,5 months (45 days) · 1579 mln rub. / 12 (365 days) = 197,5 mln rub.,

The standard of production stocks for old materials:

PS_{old} = LPS · MF_{old} = 1,5 months (45 days) · 136 mln rub. / 12 (365 days) = 17,1 mln rub.

The general standard of production stocks:

$PS_{gen}n = PS_n + PS_{old}d$ = 197,5 + 17,1 = 214 mln rub.

The received general standard more correctly reflects the need for the content of stocks and allows to save 1 % of the funds intended for the purchase of new material resources in connection with the reduction of the stock in the warehouses by 6,5 %.

The proposed option will increase the transparency of the normalization of production stocks, will affect the planning of the involvement of stocks in the production

process, including illiquid and unpopular ones, and as a result will help meet the needs of customers in materials by a set of deliveries for applications prepared taking into account plans to involve stocks from warehouses of the departments.

This decision becomes one of the factors for the implementation of available intra-industry reserves to improve the efficiency of the subsystem of material-technical supply of JSC Russian Railways.

II.

Planning of the volume of material and technical resources at the linear enterprises and in their shops, in our opinion, is expedient to be carried out by the method of G. Ya. Kozhekin and L. M. Sinitsa [4]. The supply of workshops and linear enterprises (carload and locomotive depots, track distances, power supply, etc.) should be carried out in full accordance with the established spending limits and production features. The latter are taken into account when developing schedules of feeds, on the basis of which materials are delivered to the shops. The stock limit is established based on the production program of the workshop and the specified consumption rates.

The calculation of the limit is made by the formula:

$$L = N \pm N_{c.p} + S_s - E, \quad (7)$$

where L – limit of the nomenclature of production; N – need of the workshop in the materials for the performance of the production program; $N_{c.p}$ – need of the workshop in materials to change the work in progress (+ increase, – decrease); S_s – standard of the workshops' stocks of this product; E – estimated expected product balance in the workshop at the beginning of the planning period [4].

The calculation is carried out in natural terms. The demand for materials for the performance of a production task is determined by multiplying the production program by the consumption rates for the respective products. In the same way, the demand for materials for changing the work in progress is calculated, i.e. by multiplying the production rates of expenditure for the change in the work in progress program in the planning period.

The workshop stock is determined in necessary cases and depends on the size of the batch of products delivered to the workshop, its average daily consumption, and also on the cyclical nature of production.

The estimated expected balance of material resources in the workshop is based on the work of the shop in the period preceding the planned:

$$E = E_a + V_a - (C_{m.p} + C_{o.n} + C_{c.p} + C_d), \quad (8)$$

where E_a – actual balance on the first day according to the inventory of the accounting data;

V_a – number of materials released to the workshop for the entire period;

$C_{m.p}$ – actual expense on main production;

$C_{o.n}$ – actual expense on repair-operational needs;

$C_{c.p}$ – actual expense on change of the work in progress;

C_d – expense on defect (formalized by a write-off act).

The actual expense on the main production and repair-operational needs is calculated by multiplying the actual volumes of work with the norms of expenditure of material resources in force in this period [4].

As a result of introduction of the proposed changes:

• will increase:

– effectiveness of planning the supply of material and technical resources,

– effectiveness of monitoring the content of inventories in terms of standards,

– transparency of rationing of production stocks;

• will decrease:

– maintenance of stocks of commodity-material resources, including: illiquid and unpopular,

– operational costs of the Directorate for the related supplies of inventory.

When planning production stocks, it is also necessary to take into account that several methods of inventory accounting have been recommended by the International and domestic accounting regulators. The procedure for circulation of investments in inventories is described by the following relationship [6].

$$Inv_b + SPL = COGS + Inv_e, \quad (9)$$

where Inv_b – stocks at the beginning of the period (input stocks); Inv_e – stocks at the end of the period (output stocks); SPL – receipt of raw materials for the period; COGS – production cost.

From the above balance, it follows that the same amount (the right side of the expression) is allocated to both the cost price and the output stocks. In practice, the following methods are used:

– of cost of each unit;

– of average cost price;

– of cost of the first-time acquisition of inventories (the FIFO method);

– of cost of the last in time acquisition of inventories (the LIFO method).

Conclusion. *The choice of the method significantly affects the financial results. Thus, the FIFO method provides a relatively larger increase in advanced capital, better values of profitability indicators. The use of the LIFO method results in a lower estimate of production stocks and a lower profit margin. But it should be noted that in the conditions of inflation, which is typical for the present time, the LIFO method is most preferable, since the amount of tax paid is less, and in this connection, the greater amount of funds remains with the enterprise.*

Valuation methods can be applied both once at the end of the reporting period, and permanently, that is, accompanying the supply of stocks to production [6]. Nevertheless, the question is how much any corrections in the calculations and indicators will meet the prevailing circumstances of the industry market and the reasonable tactical flexibility of the enterprise.

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