METHOD OF CREATING INDIRECT PRODUCTION MANAGEMENT BASED ON COMPLEX COORDINATION WITH DIRECT PRODUCTION PROGRAM

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In the present article the optimization of the model of indirect production at large-scale enterprises and the model of creating the costs of indirect production are developed. The method of creating the management of indirect production, based on the coordination with direct production program, is developed.

Optimization model of indirect production at large-scale enterprises

The first distinctive feature of large-scale enterprises is multi-production. The second one is a ramified complex of indirect productions, which have completely different functions.

Thereby that is a great challenge to create an optimization model that can take into account the functioning of direct production, as well as all the indirect productions, and to design a program for developing indirect productions, based on this model.

At the first stage indirect productions are grouped in accordance with their functions. Therefore, the differentiation of indirect productions allows identifying the following production types:

$C_{\beta 0}^{nj}$

a) Productions, dealing with keeping and repairing direct production facilities, for which direct production floors are the basic working area.

b) Productions of other functions, for which the volume of services for direct production is the basic working area.

This distinction is based on the assumption that production facilities are in good condition and they serve as a resource for direct production.

At the second stage indirect productions of the first type are divided according to the types of products of direct production; as a result, the optimization model of direct and indirect productions at large-scale enterprises is modified into a multitude of models for monoproduct direct production.

At the third stage production volume and sales volume of direct production of *n*-type products are divided between its indirect productions.

It is necessary to note, that the indices discussed below are conditional. That means indirect productions in accordance with their functions do not take part in production and sale of the main products of the enterprise. However, the given method is extensively used in indirect cost sharing of production sector, therefore it may be used in production and sales value sharing.

The limitation of production facilities $x^j = \psi^j\left(q^j\right)$ expresses the limited level of production facilities. The limitation of repairing works periods $y^j = \varphi^j\left(x^j, t^j\right)$ shows that the program of repairing works is formed in accordance with the intensity of using direct production facilities.

The model of indirect production costs formation

Total indirect production costs of a large-scale enterprise are assumed as a sum of economic elements.

$$C_{\beta}^{nj} = \sum_{i=1}^{Ix} x_i^{nj}\left(a_{xi}^{nj} + b_{xi}^{nj} + c_{xi}^{nj}\right) +$$

$$+ \sum_{i=1}^{Iy} y_i^{nj}\left(a_{yi}^{nj} + b_{yi}^{nj} + c_{yi}^{nj}\right) + C_{\beta 0}^{nj},$$

where $a_{xi}^{nj}, b_{xi}^{nj}, c_{xi}^{nj}$ - salaries, materials, capital consumption expenses, per 1m^2 of *i*-type work (with direct production facilities $= X_i^{nj}$); $a_{yi}^{nj}, b_{yi}^{nj}, c_{yi}^{nj}$ - salaries, materials, capital consumption expenses, per 1m^2 of *i*-type work (with direct production facilities $= Y_i^{nj}$); - general production costs of indirect production.

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The method of optimizing the system of resources supply in indirect production

Here is the way to plan the number of indirect workers. At the first stage all indirect works are differentiated in accordance with their direction:

a) keeping production facilities;

b) repairing production facilities;

Then all indirect works are differentiated in accordance with the types of works.

At the second stage the average salary of indirect workers based on data for the previous period is calculated.

At the third stage the number of indirect workers is calculated, in accordance with the type of work they do and the annual payroll Φ_i^{Π}. If the planned number of workers is not a whole number, the opportunity of work mix should be analyzed.

Planning supporting materials expenses

In this case the types of works are the basis for planning. The following indices should be used as the basis for planning:

First of all, we plan the value of facilities to be kept and repaired in the period of X_i^*, Y_i^*;

Secondly, we plan an average material expense on keeping or repairing works per 1m^2:

$$m_{xik} = \frac{M_{xik}^{\phi}}{X_i^{\phi}}, m_{yik} = \frac{M_{yik}^{\phi}}{Y_i^{\phi}},$$

where $M_{xik}^{\phi}, M_{yik}^{\phi}$ is the actual level of *k*-material expense for *i*-work.

The calculation of necessary material expenses in the planned period:

$$M_{xik}^{\Pi} = \frac{C_{\beta Mi}^{\Pi}}{m_{xik} X_i^*}; M_{yik}^{\Pi} = \frac{C_{\beta Mi}^{\Pi}}{m_{xik} Y_i^*},$$

where m_{xik}, m_{yik} is an average *k*-material per 1m^2 of *i*-work; $C_{\beta Mi}^{\Pi}$ is the planned values of material expenses.

Therefore, at the stage of calculating the indirect budget, when the planned sums of amortization costs were determined, we should take into account the average amortization norms to determine the capital costs:

$$A_{xi} = \frac{C_{\beta Ai}^{\Pi}}{n_{xi}^a}; A_{yi} = \frac{C_{\beta Ai}^{\Pi}}{n_{yi}^a},$$

where n_{xi}^a, n_{yi}^a is an average amortization norm;

$C_{\beta Ai}^{\Pi}$ is the planned value of amortization costs.

Conclusion

The method of turning from the model of large-scale enterprise to the model of optimization of each indirect production, which allows solving optimization problem using direct production cost sharing between the indirect productions is shown and proved. This problem is solved in the conditions of multi-production and a ramified complex of indirect productions, which have completely different functions.

The optimization model of indirect production for keeping and repairing production facilities is developed.

The method of creating a program of resources supply for indirect production is formed. This method allows:

evaluating the needs of indirect production for workers that deal with keeping and repairing direct production facilities;

forming a request list to supply indirect materials, used to maintain and repair direct production facilities.

forming a request list to supply equipment, used to maintain and repair direct production facilities.

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