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## MEASUREMENT OF THE PERFORMANCE LEVEL OF LONG-TERM SERVICES

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**Summary:** The paper presents characteristic features of services which, pursuant to the Polish balance sheet law, are treated as long-term services. Subsequently, the methods of determining the performance level of the service in progress as of the balance sheet day are presented based on the example of numbers, and the circumstances in which they ought to be applied are described. The results of the comparison of various methods are presented visually in the conclusion.

**Key words:** long-term services, performance level.

### 1. Introduction

Long-term services are individual performances. Their nature is exceptional. The customer expects from the service provider a specifically determined result described in detail in the agreement. Provision of such services usually involves the necessity to incur high expenditures during the performed works, which the service provider is not able to ensure, and therefore it normally seeks external sources of financing. The system of establishing the final price is complicated, which is a result of the necessity to employ subcontractors (if the expected result is complex and the contractor is not able to achieve it on its own), and is connected with a long period of providing the services. However, the major cause of the detailed discussions in accounting concerning the specificity of these services is their property consisting in the fact that the service is commenced and completed in different reporting periods. Hence, the main problem in accounting becomes the necessity to value the service in progress as of the balance sheet day. In order to carry out a correct valuation a method of determining the service performance level needs to be selected and properly employed.

The aim of this work is to demonstrate that the selection of the instrument of the performance level did not significantly affect final amount reported in a financial statement in units providing long-term services. This article uses several research methods such as method of induction and deduction.

## 2. Methods of measuring the service performance level

In order to determine the performance level an economic entity may select an appropriate method specified in the Accounting Act [Art. 34a, p. 2] or use a different one if it reflects the service performance level in a reliable way for the performances carried out by this entity. The service performance level may be measured by the following methods:

- the share of the costs incurred from the date of concluding the agreement to the day of determining the revenue in total costs of the service provision;
- the number of the directly earned hours of providing the service;
- based on the quantity survey of the performed works;
- employing contractual settlement units (e.g. linear kilometre of the road);
- the linear method;
- employing other analogous settlement units, e.g.:
  - machine hours of the equipment operation,
  - value or quantity of the consumed materials.

When selecting the method of assessing the performance level the following factors need to be taken into account:

- diversifying the activities necessary to provide the service;
- value of the input material;
- participation of specialised equipment.

## 3. The measurement of the performance level with the percentage share of costs

What results from the economic practice is that the most frequently used method of measuring the performance level is the share of actually incurred costs in the total budgeted costs of executing the agreement. The method consists in determining the proportion between the costs actually incurred from the beginning of the term of the agreement until the balance sheet day and the total of the costs budgeted in the agreement (cost estimate). The service performance level ought to be calculated based on the following formula [KSR 3, No. 16 item 88]:

$$\frac{\text{Actually incurred costs of the agreement from the beginning of its term until the balance sheet day}}{\text{Actually incurred costs of the agreement from the beginning of its term until the balance sheet day} + \text{Costs which still need to be incurred, necessary to fully execute the agreement, and which result from the current global budget of the costs of the agreement}}$$

It is assumed next that the calculated percentage corresponds to the proportion of the revenue for a given period to the revenue specified in the agreement. However,

the condition for a reliable measurement is an accurate specification of the amount of the incurred costs to the actually performed works. Errors in determining both the incurred costs and budgeted costs may result in distorting the relation of the service performance level. When applying this method of measuring the works performance level, revenue is specified as an item of the profit and loss account, whereas the amount of the costs substantively related to revenue results from the source documents (they are not reduced by the volume of work in progress). The differences between the estimated revenue (calculated based on the Accounting Act) and the revenue determined based on own invoices are recognised as deferred revenue.

In order to fully present the methods of assessing the performance level an example is prepared. The confrontation of the results with the application of various methods is presented on this example. The method of calculation and the results obtained by the employment of the first discussed method are presented in example 1 (Table 3).

### **Example 1**

*Assumptions: The company concluded a long-term agreement on provision of services in the form of the lump sum agreement in the amount of PLN 1,800,000. The planned costs had been calculated prior to the conclusion of the agreement for the amount of PLN 1,781,000. The term of performance was planned for 3 years. The revenue from the sales based on the invoices issued by the entity and the actually incurred costs in the individual years of performing the service are presented in Tables 10 to 12.*

**Table 1.** Revenue from the sales based on the issued invoices

Years	revenue from sales
year 1	971,000.00
year 2	568,000.00
year 3	261,000.00
TOTAL	1,800,000.00

Source: own study.

**Table 2.** Direct costs actually incurred in individual years of performing the agreement

Years	Number of man-hours	Rate [PLN/h]	Value	Materials	Sum
Column no.	1	2	3	4	5
year 1	18,600.00	50.00	930,000.00	30,000.00	960,000.00
year 2	10,700.00	50.00	535,000.00	26,000.00	561,000.00
year 3	5,000.00	50.00	250,000.00	10,000.00	260,000.00
TOTAL	453,000.00		1,715,000.00	66,000.00	1,781,000.00

Source: own study.

*The works performance level will be measured with the share of the costs incurred from the date of concluding the agreement until the date of determining the revenue in the total costs of the service provision*

**Table 3.** The results of employing the method of specifying the works performance level with the share of the incurred costs to the budgeted costs

	Year I	Year II	Year III
column no.	1	2	3
ascending actual costs until the balance sheet day	960.000.00	1.521.000.00	1.781.000.00
works performance level as of the end of the year (the percentage relation 1/3, 2/3)	53.90%	85.40%	100.00%
revenue by performance level	970.241.44	1.537.226.28	1.800.000.00

\* All decimal places were taken into account in the calculations.

Source: own study.

It is recommended to apply the described instrument when valuating services as part of which diverse activities are performed. The costs of services the performance level of which is established by means of this instrument are characterised by a high share of both blue and white collar workers' remuneration, and of the consumption of direct materials. These are material-intensive performances as part of which physical and mental works are performed in a proper sequence. As part of valuating such agreements, the analysis of the structure of the budgeted costs ought to be conducted. If the budgeted material input is dominant and the labour costs are low, the works performance level may be measured with settlement units, such as the value or volume of the consumed materials. In practice, it is extremely difficult to assign this measurement method to a particular group of services in an unambiguous manner and at the same time eliminate the remaining ones. The discussed method is most frequently employed in practice because the total data on the costs are sufficient to apply them, no additional detailed information on specific agreements is needed.

#### **4. The measurement of the works performance level with the number of direct earned hours of performing the service**

When applying the performance level measurement methods other than the percentage share of the incurred costs, the estimation of all measurable effects of the long-term agreement is carried out. The value of revenue and costs is determined in the ascending account by multiplying the sum of the budgeted revenue and costs stipulated in the agreement by the works performance level. Thus calculated categories are the basis for determining the revenue and costs influencing the financial result of the current period. The differences between the revenue from the source

documents – invoices – and the ones influencing the financial result are recognised as deferred income. Analogous differences in the category of costs are also recognised in the balance sheet. An indispensable condition of applying this instrument is having a reliable budget of hours necessary to provide the service and the system of recording working hours on the ongoing basis with respect to the performed investment tasks.

As a continuation of the discussion related to example 1 the calculation of the works performance level was carried out based on the number of the direct earned hours of performing the service (Table 5).

***Example 1 continued***

*The service valued based on the works performance level method. The works performance level will be measured with the number of the direct earned hours of providing the service.*

**Table 4.** The results of applying the method of performance level with the share of the direct earned hours in the number of total budgeted hours

	Year I	Year II	Year III
hours earned during the year in the ascending account	18.600	29.300	34.300
works performance level based on the number of earned direct hours (percentage relation col. 1/col. 3, col. 2/ col. 3)	54.23%	85.42%	100.00%
revenue by performance level	976.093.29	1.537.609.33	1.800.000.00
costs by performance level	965.790.09	1.521.379.01	1.781.000.00

\* All decimal places were taken into account in the calculations.

Source: own study.

The works performance level measured with the application of this method is most frequently employed in the services the effect of which is a work being exclusively or in a considerable part a result of the work of white collar workers. This type of services is characteristic for the IT sector and all design works. In the case of computer system implementation services the price stipulated in the agreement is frequently established based on the forecast of the number of hours needed to perform the aim specified therein. The calculation of the hours needed to perform the task is based on historical data and experience of the entity. Units resulting from the standard working time are often employed by companies for the purpose of valuating the services. Applying this method requires detailed recording of the working time of individual workers with respect to the agreements in which they are involved. In the production services it is also possible to apply this method in particular in assembly works, e.g. assembly of steel structures. In the group of construction services such services may be distinguished whose progress is strictly connected with the number of earned hours of direct production workers. These are construction

installation works, as part of which similar activities are performed, e.g. installation of electrical wiring. The measurement may be also conducted by means of machine hours of the construction equipment operation used in earth works, which are a part of construction works. This measurement method may be applied in assessing the research and development works performance level. This group of services may be extremely diverse based on the nature of the undertaken activities necessary to execute the agreement. Such a measurement is possible to use if the number of earned hours may be assigned as a factor of the progress of works. The project manager is responsible for selecting the performance level measurement.

## 5. The measurement of the works performance level based on the quantity survey of the performed works

When establishing the performance level based on the quantity survey of the completed works, both revenue and costs, which will determine the financial result of the economic entity, need to be established. When valuating the completed works, volumes are used with which the contractual price of the service was set. Next, the proportion of the completed works to the total value of the works specified in the agreement is determined in the ascending account. If it is impossible to proceed from partial quantity surveys to the contractual price, the measurement is considered unreliable.

On the basis of the data from example 1 valuation of an unaccomplished service as of the balance sheet day with the application of the quantity survey of the performed works is presented (Table 7).

### *Example 1 continued*

*The service valuated based on the method of the works performance level. The works performance level will be measured based on the quantity survey of the completed works.*

**Table 5.** The effects of applying the method of the performance level (the measurement of the performance level based on the quantity survey of the performed works)

	Year I	Year II	Year III
ascending actual costs until the balance sheet day	960.000.00	1.521.000.00	1.781.000.00
works performance level as of the end of the year based on the quantity survey of the works (specified by the technical department)	50.00%	80.00%	100.00%
revenue by performance level	900.000.00	1.440.000.00	1.800.000.00
costs by performance level	890.500.00	1.424.800.00	1.781.000.00

Source: own study.

In practice the quantity survey is conducted fairly often but not as the measurement of the works performance level. During the accounting year accounting for subsequent stages of works performance specified in the agreement is frequently carried out based on the quantity survey with the inventory report where the performance level is not stated. A similar situation occurs when the agreement, although pursuant to the Accounting Act it is long-term, does not have a specified price (or an approximate price at the most), and the accounting is carried out in stages with the quantity survey of the works. In such an event the quantity survey does not reflect the share of the works in the total budgeted works since the final effect of the agreement is merely approximate. In fact, a service the effect of which is not strictly defined should not be subject to valuation as an unaccomplished service as of the balance sheet day.

The described method of measurement may be employed in construction, e.g. for works related to preparing the site for construction, or finishing works.

## 6. The measurement of the works performance level with use of contractual settlement units

Contractual settlement units may be employed to determine the works performance level for the services which are a set of identical or similar partial works. As a continuation of the calculations related to example 1, it was assumed that the provided service was composed of 10 identical parts (units). The example presents the valuation of an unaccomplished service by the contractual settlement unit as of the balance sheet day.

### *Example 1 continued*

*The service valued based on the method of the works performance level. The works performance level will be measured by the settlement unit.*

**Table 6.** The results of applying the method of the performance level (the measurement of the performance level with the settlement unit)

	Year I	Year II	Year III
ascending actual costs until the balance sheet day	960.000.00	1.521.000.00	1.781.000.00
the number of the performed settlement units (specified by the technical department)	5.5	8	10
works performance level as of the end of the year	55.00%	80.00%	100.00%
revenue by performance level	990.000.00	1.440.000.00	1.800.000.00
costs by performance level	979.550.00	1.424.800.00	1.781.000.00

Source: own study.

This method of measuring the performance level is usable only in certain services, such as digitalisation of cartographic materials (IT services), the number of kilometres of a road or tracks (construction works), naturally taking into account the coefficient for sections the construction cost of which is different.

## **7. The measurement of the works performance level by the linear method**

The linear method as a measurement of the works performance level assumes that the execution of the agreement is uniformly distributed over the term of the entire service. The measurement of the performance level with this method is carried out based on the elapse of time. As part of the measurement equal instalments of revenue and costs are assigned to subsequent reporting periods over the term of the entire service. Such a measurement may be employed e.g. in education or technical support services. The subject of such agreements are mainly the activities where a specific result is difficult to determine. They are, in fact, agreements of due diligence in nature. Pursuant to the Accounting Act, services of the type do not satisfy the conditions of the long-term services. Single activities performed as part of one agreement are repetitive, and upon their performance they are accepted by the customer. Despite the time criterion is met by them, they do not satisfy the condition of not being accomplished. A service accepted by the customer is an accomplished service. In such cases the term of the agreement should not have an impact on classification.

Regardless of the methods of measuring the works performance level described above there are two in practice approaches to this issue. The performance level of a service may be established:

- from the point of view of the input,
- from the point of view of the effects.

The former approach is costly one, where the relation of the incurred cost to the total budgeted costs is determined. Next, it is assumed that the percentage is an equivalent of the percentage of the revenue for a given period to the revenue budgeted for the entire service.

The latter approach is a measurement of the already completed works and their valuation with the cost estimate rates based on which prices were stipulated in the agreement. Later, the relation of the valued works to the total value of the agreement is established. In such an event differences between the actually incurred costs and the costs influencing the financial result may occur, the differences which are reflected in the balance sheet as deferred expenses.

When applying the method of the performance level, services in progress practically do not occur. Activating costs as production in progress may occur in the form of:



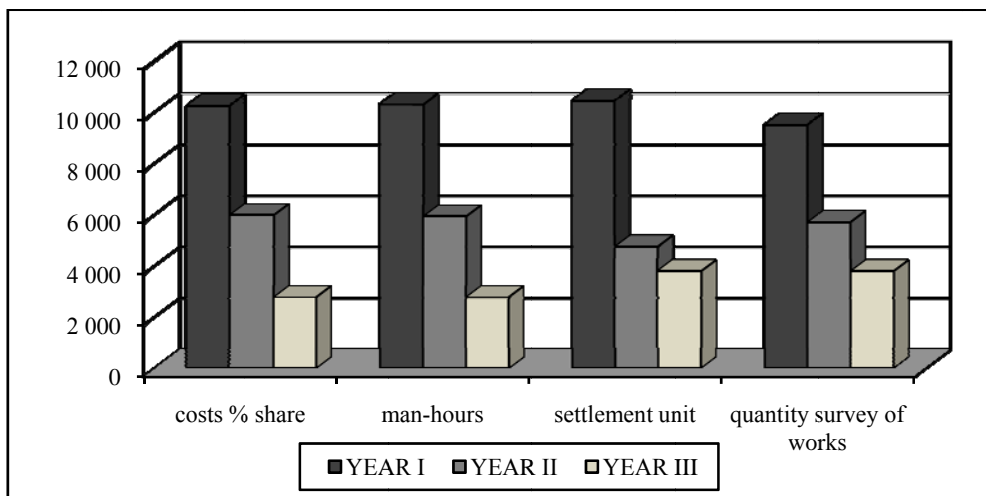
- not incorporated materials,
- advance payments for subcontractors on account of future works,
- commenced services which are not covered by the agreement when it is almost certain that the agreement will be concluded.

The economic entity ought to verify the correctness of the methods of establishing the performance level not later than as of the balance sheet day. Potential adjustments caused by updating the price of the service or the budget of the costs, as well as the correctness of establishing the performance level should be recorded in the period of their disclosure. On estimating a loss related to a service in progress, a provision should be established amounting to the surplus of costs over revenue charged to the production cost, not to the other operating costs.

The comparison of the effects – results – of the application of various methods of assessing the performance level in example 1 is presented in Table 7 and visually in Figure 1.

**Table 7.** Results established based on the individual methods of calculating the performance level

P&L account	Year I	Year II	Year III
result based on the share of incurred costs to budgeted costs	10.241.44	5.984.84	2.773.72
result based on the number of earned hours	10.303.21	5.927.11	2.769.68
result based on the quantity survey of the performed works	9.500.00	5.700.00	3.800.00
result based on settlement unit	10.450.00	4.750.00	3.800.00



**Figure 1.** The results in subsequent years of performing the service established based on the individual methods of evaluating the performance level

Source: own study.

The results of the discussion presented in Figure 1 indicate that the results of applying the individual methods of determining the performance level are similar. The discrepancies are not significant and do not have a considerable impact on financial results.

## 8. Conclusion

To sum up, it needs to be stated that the selection of the instrument of the performance level depends on the variety of activities performed in an appropriate sequence which are indispensable for obtaining the result specified in the agreement, the value of the input material and the involvement of specialised equipment. When deciding on a given instrument, the availability of specific data, which need to be included in the budget of the costs of the service, and the possibility to verify them on the ongoing basis, ought to be taken into consideration. In the majority of cases the application of various instruments does not result in clear disproportions in the estimated revenue as part of one service. In most events the differences do not play a significant role in the process of determining the result of the economic entity. However, certain situations where discrepancies occur may be observed.

## Literature

1. Ustawa z dnia 29 września 1994 r. o rachunkowości (Dz. U. z 2002 r. nr 76, poz. 694 z późn. zm.).
2. Krajowy Standard Rachunkowości nr 3 „Niezakończone usługi budowlane” (Dziennik Urzędowy Ministra Finansów nr 16, poz. 88).

### **POMIAR STOPNIA ZAAWANSOWANIA USŁUG DŁUGOTERMINOWYCH**

**Streszczenie:** W artykule zaprezentowano cechy charakterystyczne usług, które zgodnie z polskim prawem bilansowym traktuje się jako długoterminowe. Następnie na przykładzie liczbowym przedstawiono metody ustalania stopnia zaawansowania usługi będącej w trakcie realizacji na dzień bilansowy oraz opisano, w jakich okolicznościach należy je stosować. W podsumowaniu zaprezentowano graficznie wyniki porównania zastosowania różnych metod.