

# Fundamental Issues Concerning the Organization of Management Accounting in Units of Natural Resource Exploitation

**Lucia PALIU-POPA**

[univers\\_cont@yahoo.com](mailto:univers_cont@yahoo.com)

**Nicolae ECOBICI**

[mycu2004ro@yahoo.com](mailto:mycu2004ro@yahoo.com)

**Ionela-Claudia DINA**

[dina\\_claudia@yahoo.com](mailto:dina_claudia@yahoo.com)

*Constantin Brâncuși University of Târgu Jiu*

## **Abstract**

The complexity of economic life in the competition imposed by the market economy requires a continuous search and use of the most rational and efficient organizational forms and methods of managerial accounting and therefore of production cost calculation. The implementation of such method must consider both the specific of companies where it will be used and the requirements of a modern information system, able to respond at any time to the continuous pressure exerted by external factors of the company.

**Keywords:** management accounting, costs, expenses, coal mining

**JEL Code:** L72, M11, M41, O13, P42, Q30

## **1. Introduction**

Given the opinion of C.I.M.A. Institute<sup>42</sup> that *management (managerial) accounting* is the process of identification, measurement, accumulation, analysis, interpretation and communication of information used in planning, evaluation and control of an entity for a responsible use of its resources, we may say that in these circumstances the management accounting connects economic activities and decision-makers. Starting from this main objective of the management accounting, its organization and direction within the units of natural resource exploitation and therefore of those of coal mining - which are also the subject of this exposure - must have as a starting point the study in advance of all *factors* and *principles of cost calculation*, which influence decisively the decision on choosing a specific method of calculation.

## **2. Factors Determining the Choice of Cost Calculation Method**

In any economic unit, the organization of works in management accounting and cost calculation depend on several factors among which we mention<sup>43</sup>: company size, production technology, its type of production and organization, organizational structure (production, design and functional structure) of the unit, continuity of the production process (continuous or seasonal), management methods and techniques adopted, etc.

As for the *size of coal mines* we can say that it is the determining factor affecting the choice of general principles of organization and performance of calculation works and development of budgets for the purpose of their centralized or decentralized organization. In the said mining units, cost calculation is usually organized on the principle of centralization and assumes a single

---

<sup>42</sup> Chartered Institute of Management Accountants

<sup>43</sup> Oprea, C., Cârstea, Gh. - *Contabilitatea de gestiune și calculația costurilor* [Management Accounting and Cost Calculation], Atlas Press Publishing House, Bucharest, 2003

financial accounting department with engagement of a small number of specialized personnel that is however not involved in the production process itself and therefore leads to a decrease in the efficiency of activities of control and operational analysis of the expenditure.

*Production technology* is a factor with important implications on the organization of management accounting, considering that it includes all the processes, methods and operations to be performed to obtain the finished product. In the coal mining companies, production has a homogenous and unitary nature, consisting of a variety of partial processes, gathered however in a single production cycle. Thus the production process in the companies we analyzed consists of a *main (technological) process*, directly related to coal mining and several *auxiliary and service processes* which are divided into a series of operations performed at work by one or more performers, which in turn generate a series of material expenses, salaries, wear of fixed assets etc.

*Its type of production and organization* is in my opinion, the factor with the most profound implications for the organization of management accounting. Type of production means an organizational and functional status of the company, given the diversity and volume of products obtained, the degree of specialization of the company and how the products are moved from one job to another.

In the economic units where the business activity is production, its organization is based on all the work processes and natural processes which aim to obtain the finished product.

Considered generally, the organization of production within a production unit refers to: the choice and foundation of production structure of the unit, organization of production processes, choice of working machines used and their location, establishment of rules for motion to be followed, specification of workers' professional composition and skill level etc.

Thus, in our analysis starting from the nature and character of production and its organization, we can also determine accurately the cost calculation method to be used in each production unit.

Therefore, in the companies with *simple mass production*, where coal mining falls within, the type and organization of production determine the use of the global calculation method (in lignite) and the phase calculation (in pit coal), where the finished product is obtained after going through various stages of works, namely<sup>44</sup>: work preparation, coal mining, coal transportation which also includes its underground transportation, bringing to the surface and loading into wagons; maintenance and repair of galleries, general aeration of the mine; other works required in the production process and not least the transport of materials from the warehouse to the mine and shafts. Another important factor on which management accounting and cost calculation focus organizationally and functionally is the *organizational structure* of the company represented by the design and production structure and by the functional structure.

The organizational structure of production and the management system is a factor with complex and multiple influences on the organization of the economic information system and of the accounting information in particular, which is reflected in the internal structure of economic units, in accordance with the production tasks, unit size, its relations with the tutelary body and other organs of information and control.

The production activity within any company is complex, encompassing both manufacturing it itself and a series of activities directly related to it. The production process in coal mining leads in

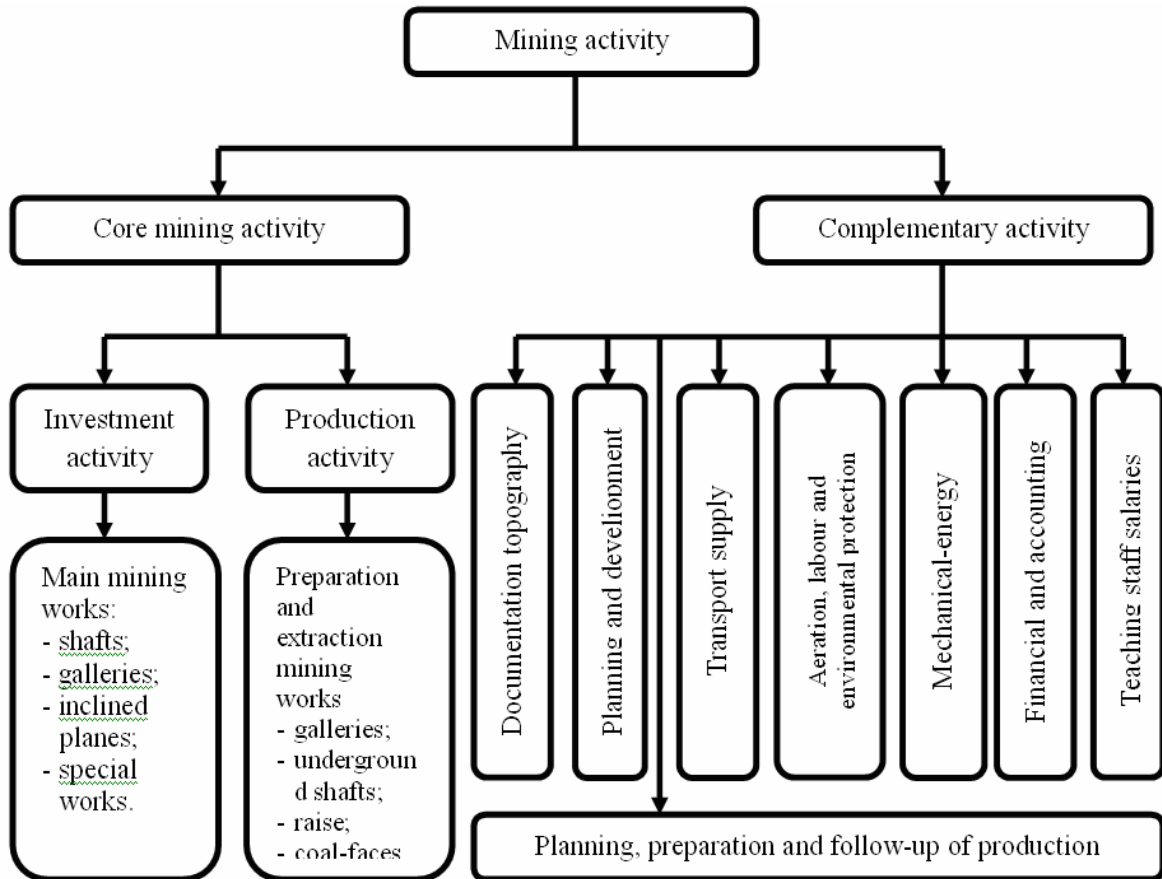
---

<sup>44</sup> Teiușan, S.C. – *Perfecționarea contabilității cheltuielilor de producție și a calculației costurilor în industria extractivă a huilei, [Improvement of Accounting of Production Costs and of Cost Calculation in Pit Coal Mining Industry], PhD thesis, Bucharest, 2007, page 168*

terms of organization and management to a certain general organizational structure made of two main components: the production structure and the complementary structure.

An overall graphical representation of the organizational structure of coal mining units is reflected in Figure 1.

Figure 1 Overall scheme of mining activity



Source: Pădure, I., Palamariu, M., Bălănescu, S., Sălăjan, C., Spătar, C. - *Monografii moderne de exploatare pentru zăcămintele de minereuri*, [Modern Operating Monographs for Ore Deposits], Global Media Image Publishing House, Deva, 2001, page 263

Starting from the general scheme of mining activities, the units that operate in this area have formed their own organization scheme based on the type of ore extracted.

Thus, for open-cut mining where lignite is the product extracted, the overall mining activity is structured as follows:

- *core activity*, which refers to: coal and tailings digging, coal and tailings transport on tapes in warehouses, extraction of coal from underground, opening and preparation mining works;
- *auxiliary activities* taking into account the costs of works carried out by mechanical, electrical workshops (sections), vulcanization, mining and draining for the core activity;
- *indirect production activities* such as investments by oneself, geological works carried out by oneself, conservation and closure of mining perimeters;
- *administrative activity* relating to the costs incurred and administration and management of quarries/mines;
- *sales activity* reflecting the costs incurred in connection with coal storage, its handling in inventory, sorting, crushing, loading and transport from the warehouse in wagons to the railway station.

Compared with the coal mining in the National Company of Lignite Oltenia, those subordinated to the National Pit Coal Company organized their activity in:

- *production sectors* which perform the actual extraction of coal carried out in the following phases: preparation of tailings and useful products; waste; underground transportation; transport through shafts and inclined planes; maintenance of shafts, galleries and raises, maintenance of machinery, equipment and underground facilities; aeration, water discharge etc.;
- *auxiliary sectors* operating in order to serve the basic sectors, thus providing them with: electricity, steam, transportation, storage, miscellaneous repair services, etc.;
- *annex sectors* having regard to meeting specific living needs of the staff employed by providing workers' housing, rest homes, nurseries and children's homes, etc.;
- *functional sectors* constituting the working device of the mining units management and including: production and technical service, mechanical and energy service, financial and accounting service, labour protection service, topography and geology department, organization, rate setting and pay service, supply and transportation service, legal office, etc.

The structure of production and of complementary activities creates the organizational and functional framework for the follow-up of production costs and cost calculation.

*Continuity of the production process (continuous or seasonal)* given by the period of operation of productive units throughout a year is another factor that influences the organization of management accounting in coal mining units. Therefore, in this type of unit, where work is carried out throughout the year, the actual cost calculation is performed at the end of the period of work, when the entire nomenclature of calculation items and all the production costs incurred during the management period covered is known and thus can be included in the actual cost calculated for the same period.

*The technical management techniques* adopted in a coal mining in the coal mining industry might influence the organization of management accounting and cost calculation, especially as regards the choice of a classical method (global and per phase) or the choice of a modern method such as that on responsibility centres that enables efficient tracking of consumption, through budgets made for coal mining.

### **3. Principles of Organization of Management Accounting and Cost Calculation in Mining**

The organization of a management accounting that can meet the requirements for which it was created in the coal mining units requires strict compliance with several theoretical and methodological principles that should form the basis for cost determination.

According to the legal regulations currently in force<sup>45</sup>, for the calculation as accurate as possible of production cost and for an easy control of its budget, we have to take into account a number of theoretical and methodological principles. Of all these, among the ones that best apply to the organization of management accounting and cost calculation in coal mining we can mention:

❖ *The demarcation principle of costs concerning the production, costs that are not directly related to coal mining* that refer to the need to include in the production cost only the operating costs and not the costs which do not relate to this activity such as the financial and extraordinary expenses. Thus, the production cost of coal extracted shall not include: the loss of materials, overruns fixed with salaries, due to deviations from manufacturing technologies, production process interruption losses, storage costs, distribution costs etc. As these costs do not create value, they are unnecessary to the extraction itself, and thus are not scheduled in the budgeting process, but are included, however, in the actual cost of production, which has to reflect

---

<sup>45</sup> *Order of the Ministry of Public Finance no.1826/2003 for approval of Specifications for some measures on the organization and conduct of management accounting*, published in Official Gazette of Romania, no. 23/January 12, 2004

as real as possible the total expenditure incurred by the operation process, thereby stimulating interest in the bodies responsible for avoiding such costs which have a negative impact on the size of production cost and therefore on the operation profitability.

❖ *The principle of production cost demarcation in space or by places of expenses* primarily involves the demarcation of operating costs by spheres of activity, namely costs of supply, extraction, administration and management. The spatial demarcation by main economic processes envisages the separate registration by each of them of all expenditure aimed at calculating the efficiency of their activity. Given this criterion, demarcation of expenditure in the coal mining units should be made first on the main processes that generated them, followed by a deepening of spatial demarcation in sections (core, auxiliary, of service) and within them by centres of production and responsibility, by places of expenses or cost centres, depending on the cost calculation method to be applied. Thus, we may say that the production cost includes only the expenditure related to it, taking into account only the production sites that had a contribution to obtaining the finished product.

❖ *The principle of time demarcation of production costs* implies that the extraction costs of coal deposits for each management period (month, quarter, year) should include only the costs related to the extraction in that period, regardless of the time they were carried out. As a result of applying this principle, the following groups of production costs can be distinguished: anticipated or accrued expenses, expenses of the current period and preliminary or calculated expenses.

*The anticipated expenses* are those costs incurred in the current period but relating to future management periods and here we can include the expenses related to prepayment of subscriptions, taxes, rents, etc.

*The current expenses*, which are actually most production costs, are carried out during the management period of the production that generated them and are included in the production cost in that period. This ensures an accurate calculation of the production cost of the coal extracted and therefore of the final results by taking into account properly, in addition to the current production costs, those incurred in advance or the provisions made for the production during the period.

*The preliminary expenses* are production costs that have not occurred and are based on calculations and not actual consumptions as would be the provisions for instance, expenditure on capital repairs, technical revisions and running repairs to tangible assets, etc.

❖ *The principle of separation of productive from unproductive expenditure* that is based on the economically necessary differentiation of productive expenditure, which is also creating value, from unproductive expenditure, which does not add any value to the product. The existence of such unproductive expenditure in coal mining is due to: excess of specific consumption of mining wood, electricity, explosives, use of high quality materials or sizes other than those set out in standards, provision of additional salary for deviations from the technological process established, technological process interruption loss (earth fall, fire, flood, etc.).

By using these principles in organizing the management accounting, calculation becomes an effective tool for budgeting and following up the expenditure making the production cost, influencing it over time, in order to reduce it, due to the measures that it is able to suggest.

#### **4. The System of Accounts Used**

The management accounting in the mining units, both within S.N.L.O. and those operating in Valea Jiului, is held for the quarry/mine, as the financial accounting is organized, providing the information necessary to delimit costs in direct, indirect, distribution and administrative costs in open quarries, and grouped by activities for pit coal mining.

For both types of coal mining, the accounts used for performing the accounting of production costs and cost calculation are the *management accounts* that are meant to take over the operation costs from the financial accounting where they are registered by their nature, with the purpose to

order them by destination so as to calculate the actual cost of production obtained, to settle this production and to establish the deviations of actual costs from those predefined, in order to exercise budgetary control over costs. Thus, the independence of management accounting is created compared to the financial accounting.

In the General Accounting Plan these accounts are included in Class 9 - *Management accounts* and their general characteristic is that at the end of the financial year they do not appear in the balance sheet as the data and information they reflect have already been registered in the financial accounting based on which the balance sheet is drawn up. You may also note that these accounts have a more elastic accounting function in terms of their crediting and debiting, as the organization of management accounting is up to each mining unit. That is why the characterization of these accounts and the calculation models shown will not strictly observe the *Methodological rules for using the accounting accounts*, with more than one possible variant of operation of those accounts.

In turn, that class of accounts is structured in **three groups**:

➤ **Group 90 "Internal transactions"** includes the accounts: 901 "Internal transactions relating to expenses", 902 "Internal transactions related to costs of conversion", 903 "Internal transactions relating to price differences".

*The account 901 "Internal transactions relating to expenses"* is used, on the one side to record the internal transactions relating to the costs related to core and auxiliary activities, production overheads, administrative overheads and distribution costs, which were first recorded in the general (financial) accounting, and then in the management accounting, and on the other hand, to reflect the actual cost of the production achieved.

*The account 902 "Internal transactions related to costs of conversion"* is used to record the internal transactions relating to the cost of production achieved during the month, on registration price (fixed in advance or wholesale), on the one hand, and on the other hand, to settle at the end of the month the actual cost of the same production achieved during the month, so that its balance should represent the price differences i.e., standing to the credit, favourable differences, i.e. savings and positive deviations and the balance due, the unfavourable differences, i.e. overruns, namely the negative deviations.

*The account 903 "Internal transactions relating to price differences"* is used for registering at the end of the month the difference between the registration price (fixed in advance or wholesale) and the actual cost of finished products obtained from the production process.

➤ **Group 92 "Cost accounts"** includes the following accounts: 921 "Costs related to the core business"; 922 "Costs related to auxiliary activities"; 923 "Production overheads"; 924 "Administrative overheads"; 925 "Distribution costs".

*The account 921 "Costs related to the core business"* is used to record the costs related to the core business of the unit of exploitations, developed analytically, collecting the costs of activities both in pit coal mines (tailings preparations, coal preparations, front coal-faces, coal transportation to the surface, maintenance of mining works and equipment in underground, water discharge, underground labour protection, etc.) and for open-cut mining (excavation, waste dumping).

*The account 922 "Costs related to auxiliary activities"* is used for reflecting the costs of auxiliary activities of the unit such as reinforcements, spare parts, explosives, running repairs, and the costs generated by the compressor station, ventilation station and the filter station in coal mining in Valea Jiului and those related to the electrical, mechanical workshop or the draining department in the lignite quarries.

*The account 923 "Production overheads"* is used to follow up the equipment maintenance and operation costs and the overheads of each core section of the unit.

The account 924 "Administrative overheads" is used for the administrative and management expenditure of the unit (TESA staff salaries and supplies, electricity for lighting, water, sewerage and sanitation, etc.).

The account 925 "Distribution costs" is used to record the expenses incurred in connection with marketing of the production extracted (transport - if the coal circulates on the producer's expense - handling, storage etc.), expenses whose record is organized on quarry level for lignite exploitation and centrally in the National Pit Coal Company S.A.

➤ **Group 93 "Production cost"** includes the accounts: 931 "Cost of output"; 933 "Cost of work in progress".

The account 931 "Cost of output" is used to follow up the finished products obtained, consisting of finished, semi-finished goods for sale, works performed and services provided to third parties, own investment or other activities.

The account 933 "Cost of work in progress" is used to record the actual cost of production in progress, whether derived from the core or auxiliary activity.

Next we shall try to make a summary of how the management accounts work and their correspondence in coal mining:

✓ costs collection:

	%		
	=	901 "Internal transactions relating to expenses"	<u>A+B+C+D</u>
921 "Costs related to the core business"			A
922 "Costs related to auxiliary activities"			B
923 "Production overheads"			C
924 "Administrative overheads"			D

✓ record of output at standard cost:

931 "Cost of output"	=	902 "Internal transactions related to costs of conversion"	$P_s \times Q$
----------------------	---	--	----------------

where:  $Q$  - output;

$P_s$  - standard price.

✓ record of the actual cost of the output:

902 "Internal transactions relating to costs of conversion"	=		
	%		<u>A+B+C+D</u>
		921 "Costs related to the core business"	A
		922 "Costs related to auxiliary activities"	B
		923 "Production overheads"	C
		924 "Administrative overheads"	D

✓ calculation and record of differences of standard price and actual cost:

903 "Internal transactions relating to price differences"	=	902 "Internal transactions related to costs of conversion"	<i>Actual cost - standard cost</i>
---	---	--	------------------------------------

✓ settlement of the actual cost of the output:

901 "Internal transactions relating to expenses"	=		
	%		<u>E + F</u>
		931 "Cost of output"	$E = P_s \times Q$
		903 "Internal transactions relating to price differences"	$F = \text{standard cost} - \text{actual cost}$

✓ internal settlement of distribution costs:		
925 "Distribution costs"	=	901 "Internal transactions relating to expenses" <span style="float: right;">G</span>
902 "Internal transactions related to costs of conversion"	=	925 "Distribution costs" <span style="float: right;">G</span>
901 "Internal transactions relating to expenses"	=	902 "Internal transactions related to costs of conversion" <span style="float: right;">G</span>

After entering the production costs in the management accounting according to their destination, in the places they entailed and by calculation items, in relation to the opportunities of identification from the time they are made, at the end of the month there shall be calculated the actual cost of the production achieved during the management period in the manufacturing process.

## 5. Conclusions

With the current requirements in the national economy, where the ultimate goal of any business operator is profitability, low cost and efficient products, in the management of coal mining we can feel the lack of information that would enable making some decisions able to control and reduce costs. To this end, the objective of management accounting is to ensure a permanent feedback for coal exploitations, so that the information reached to the decision-making department should be in real time and most accurate as regards the activities that exceeded the limits set by expenditure, so that these deviations could be dealt with as effectively as possible.

## References:

1. Baci, A. – *Costurile, [Costs]*, Dacia Publishing House, Cluj, 2001
2. Barbu, E. C. – *Metode de analiză a costurilor de producție [Methods of Analysis of Production Costs] – PhD thesis*, Bucharest, 2004
3. Man, M. – *Contabilitate de gestiune și calculația costurilor (pe exemplul industriei miniere carbonifere), [Management Accounting and Cost Calculation (Example of Coal Mining Industry)]*, Scrisul Românesc Publishing House, Craiova, 1997
4. Oprea, C., Cârstea, Gh. - *Contabilitatea de gestiune și calculația costurilor [Management Accounting and Cost Calculation]*, Atlas Press Publishing House, Bucharest, 2003
5. Pădure, I., Palamariu, M., Bălănescu, S., Sălăjan, C., Spătar, C. – *Monografii moderne de exploatare pentru zăcăminte de minereuri, [Modern Operating Monographs for Ore Deposits]*, Global Media Image Publishing House, Deva, 2001
6. Pârâu, F. – *Costuri și fundamentarea deciziilor, [Costs and Substantiation of Decisions]*, Economic Publishing House, Bucharest, 1999
7. Teiușan, S.C. – *Perfecționarea contabilității cheltuielilor de producție și a calculației costurilor în industria extractivă a huilei, [Improvement of Accounting of Production Costs and of Cost Calculation in Pit Coal Mining Industry]*, PhD thesis, Bucharest, 2007
8. \*\*\* - *Order of the Ministry of Public Finance no.1826/2003 for approval of Specifications for some measures on the organization and conduct of management accounting, published in Official Gazette of Romania, no. 23/January 12, 2004*