

Improvement of the cost control system based on quality management audit of military-industrial complex enterprises performing state defence order

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ORIGINAL ARTICLE

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Abstract. The article is devoted to the improvement of the cost control system at enterprises of the Defence Industrial Complex (DIC) performing the State Defence Order (SDO). The relevance of the study is determined by the growing requirements for transparency, efficiency, and rational use of financial resources within the framework of public procurement in the defence sector. Traditional cost control systems, based mainly on accounting and self-inspection methods, do not fully meet modern needs, as they fail to ensure a sufficient level of responsiveness to risks, deviations, and inefficiencies in contract execution. The paper proposes a new conceptual and methodological approach that integrates accounting, budgetary, and financial control into a unified system oriented toward compliance with legislation, reliability of financial information, and efficiency of resource allocation. Special attention is paid to the classification of costs incurred in SDO execution, their eligibility for inclusion in fixed contract prices, and their verification in accordance with legal and contractual requirements. The developed methodology introduces intermediate checks of actual expenditures, comparative analysis with planned indicators, and the use of adapted earned value methods for forecasting and decision-making. Practical application of the approach increases the accuracy of price formation, reduces unaccepted costs, and enhances financial sustainability. The results contribute to improving management efficiency and competitiveness of defence enterprises in fulfilling state contracts.

Keywords: State Defence Order; cost control system; separate accounting; price formation; audit of military-industrial complex

JEL codes: M41, H57, L64

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Introduction

Traditional cost control systems used quality control auditing of enterprise management [1]. Based on cost control systems, accounting and control include separate accounting for contracts SDO, and state regulatory methods [3, 4]. At the same time, audits included the self-inspection methods [2]. However, the concepts of audit and self-inspection do not show the price formation in terms of the cost-effective methods. Moreover, increasing the efficiency of enterprises economic activities in terms of SDO performing concerns with the theoretical and methodological base for cost control process. We introduce new approaches to the cost control system and propose new methods for assessment of cost control system effectiveness.

The research suggests the author's definition of the concept of costs and highlights the difference from the concepts of expenses and costs. The following concept based on the difference of the cost requirements set for pricing SDO contracts. Moreover, the classification has been supplemented with the statement: "The costs incurred in the execution of SDO are the company's resources used in their execution. These costs are subject to verification for compliance with the norms of legislation for SDO¹ and the terms of the contract to consider

¹ On the State Defence Order: Federal Law No. 278-FZ on December 29, 2012 (as amended on 22.04.2024); Decree of the Government of the Russian Federation No. 1465 on 02.12.2017 (as amended on 12.08.2023) "On State Regulation of Prices for Products Supplied under the State Defence Order, and on Amendments and Invalidation of Certain Acts of the Government of the Russian Federation" (with the "Provision on State Regulation of Prices for Products Supplied under the State Defence Order"); Order of the Ministry

their complying to a fixed price." The paper also considers the factors of influence and industry-specific features of cost control at enterprises of the military-industrial complex in the execution of SDO. These factors determine the prospects for further research of cost control systems, development of their scientifically based methodology in terms of the specifics of defence industry enterprises. Moreover, they construct mathematical models providing data analysis and interpretation and form approaches to determine the effectiveness of these systems and models.

Main part

Indeed, the clarification of cost control systems conceptual framework, their classification, and efficiency assessment, in terms of the specifics of defence industry enterprises executing SDO provided development of a methodology for controlling costs. This methodology is focused on the operational analysis of incurred costs in terms of their eligibility for inclusion in the fixed price under the SDO, development of management decisions aimed at reducing costs. Additionally, it substantiates a mechanism for forecasting the results of financial and economic activities based on the cost control methodology applied during the execution of the SDO, distinguished by the combined use of an adapted earned value method and production.

The developed methodology based on a systematic approach and contains the author's classification and the purpose of control and methods of its implementation. The author's proposal of a three-pronged cost control system allows defence industry to perform public procurement to increase management efficiency (Figure 1).

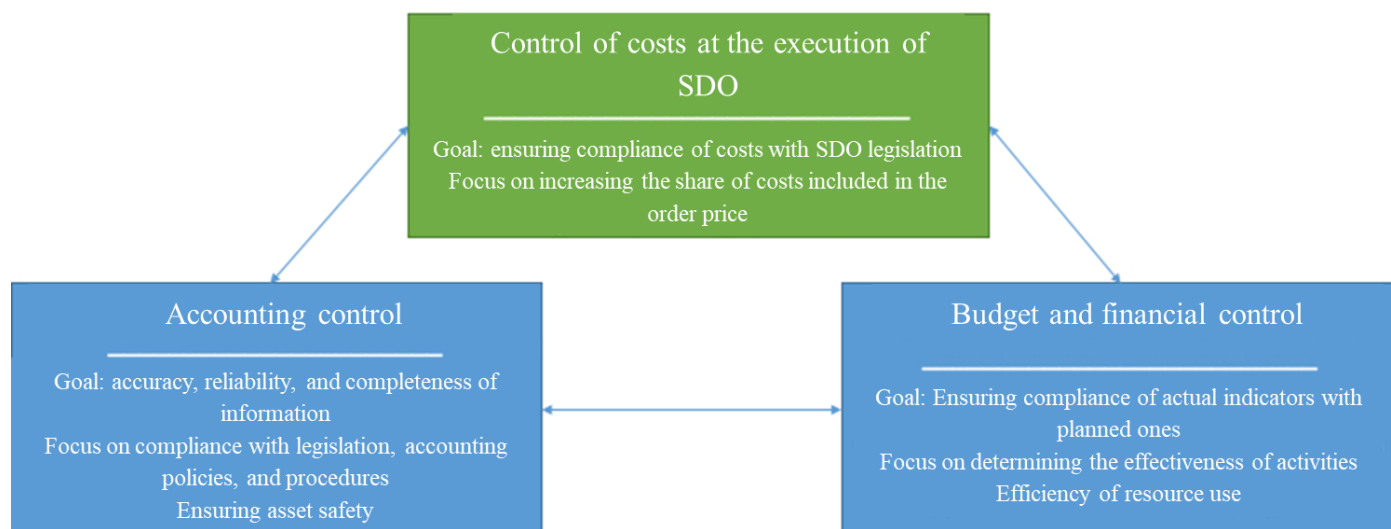


Figure 1. The general scheme of the tripartite cost control system

Source: Author

The Methodology for intermediate checking of costs during the execution of SDO (Figure 2).

The practical significance of our proposals includes more precise accountant activity to make decisions on the reflection of estimated values². For instance, to charge a reserve for the impairment of inventories (work in progress). The constant assessment of contract costs in terms of determining a fixed price provides a reliably estimation of the real fair value of assets such as the cost of work-in-progress orders. It also allows ones to charge an impairment reserve to more reliably reflect the financial condition of the enterprise.

of Industry and Trade of the Russian Federation on February 8, 2019 No. 334 "On Approval of the Procedure for Determining the Composition of Costs Included in the Price of Products Supplied under the State Defence Order"

² On Accounting: Federal Law No. 402-FZ of December 03, 2011 (amended 12.12.2023)

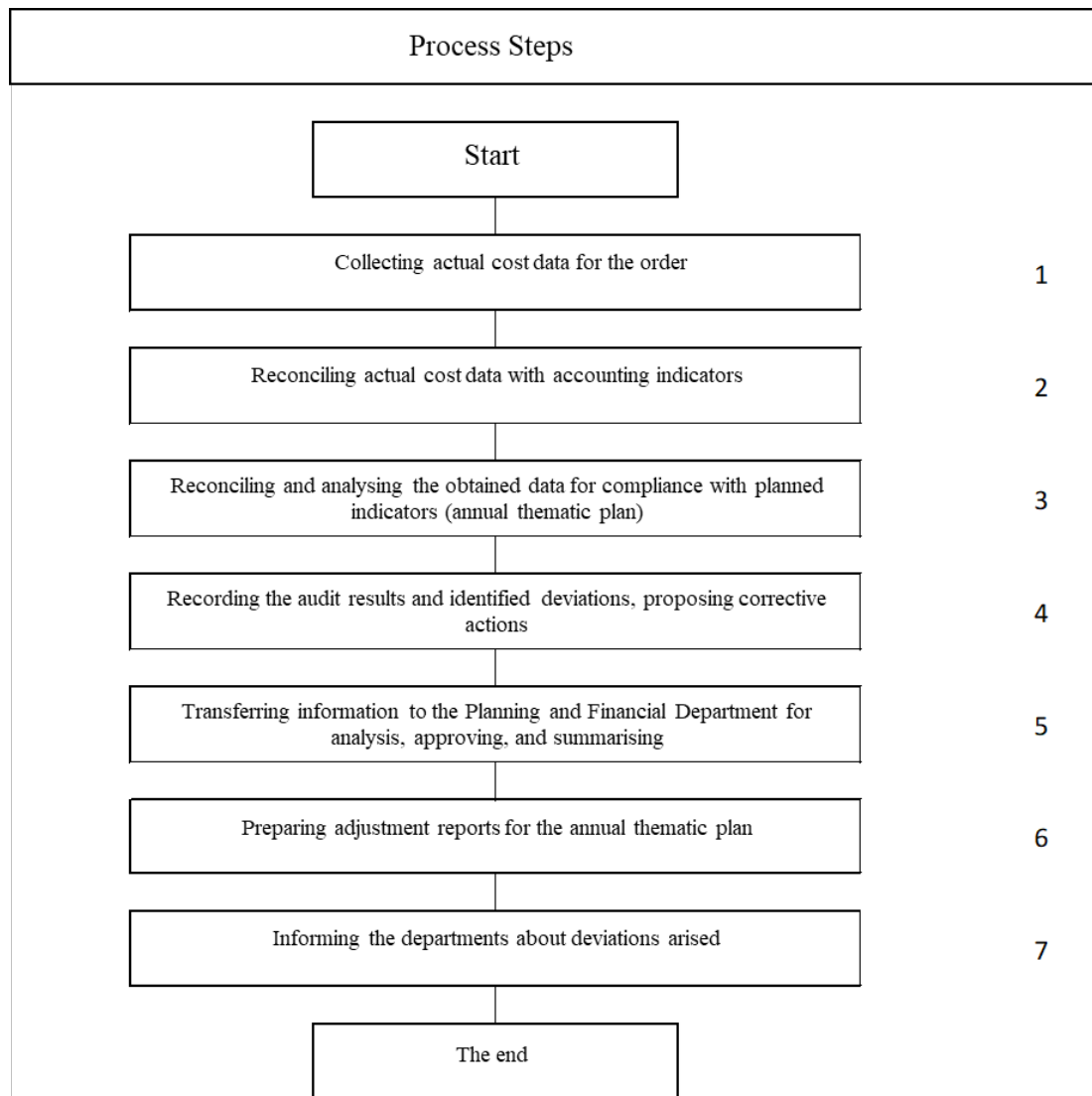


Figure 2. The methodology for intermediate checking of costs during the execution of SDO

Source: Author

The author's cost classification scheme is shown in Figure 3.

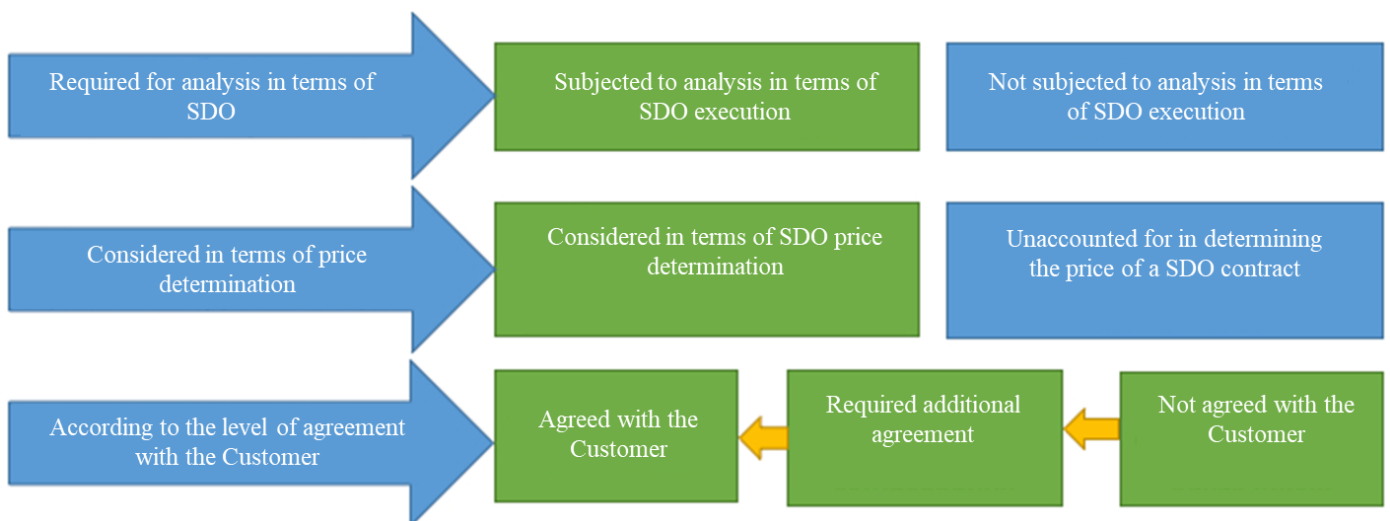


Figure 3. Classification of costs for intermediate checking of costs during the execution of SDO

Source: Author

Table 1 shows the indicators (based on [8]) for calculating the adapted mechanism of the production function.

Table 1 – Indicators for calculating the adapted mechanism of the production function. Developed by the author on the basis of the production function model by G.B. Kleiner [9] and earned value method³

Indicator	Name	Source	Value
Planned Value	(PV)	Planned Budget Data	Planned Value of Work Done at the Date
Earned Value	(EV)	Planned Budget Data	Planned Cost of Actual Work Done at the Date
Actual Cost	(AC)	Accounting Data	Actual Costs at the Date
Budget at Completion	(BC)	Planned Budget Data	Total Planned Budget
Current Cost Deviation	(CCD)	$CCD = EV - AC$	A negative value indicates resource overruns.
Cost Performance Index	(CPI)	$CPI = EV / AC$	A value of more than 1 indicates high efficiency; a value of less than 1 indicates low efficiency.
Forecast at Completion	(FAC)	$FAC = BC / CPI$	Cost forecast without eliminating of the current deviations
Forecast to Completion	(FTC)	$FTC = FAC - AC$	Forecast of the remaining costs considering continuing trend towards deviations
Rejection Upon Completion	(RUC)	$RUC = BC - FAC$	The predicted value of the deviation of actual costs from the planned ones

Source: Author

To determine the current cost of an order, it necessary to:

Based on the data on actual expenditures, and pursuant to the conducted analysis and classification of costs, determine the proportion of costs accounted for in the pricing of products within the framework of the SDO for each item of the cost estimate i:

$$\%CC_i = CC_i / AC_i,$$

where CC_i is the cost of the calculation item in terms of the purpose of SDO pricing; AC_i is the actual cost of the calculation item.

Therefore, the current (as well as the planned, forecast) cost of the order is equal to:

$$C = AC_1 * \%CC_1 * CP_1 + AC_2 * \%CC_2 * CP_2 + \dots + AC_i * \%CC_i * CP_i,$$

where CP_i is the coefficient of profitability according to the calculation method agreed with the customer.

We developed a methodology to determine the effectiveness of measures taken within the framework of the cost control system methodology.

Since the proposed cost control measures are the intermediate stages in the preparation of calculation and costing materials and do not require additional expenses, reporting calculations, price approval, the effectiveness of the control system shall be understood as the coefficient:

$$Ce = (CAC / ACA) \rightarrow 1,$$

where CAC is the cost agreed upon by the customer when forming a fixed price, ACA is the actual cost according to accounting data.

Conclusion

³ Minkevich, A. What is the earned value method? Source: <https://ampm.by/blog/earned-value-management> (accessed on 10.05.2025).

The efficiency of applying the methodology for intermediate cost control incurred during the execution of SDO has been calculated (see Figure 4).

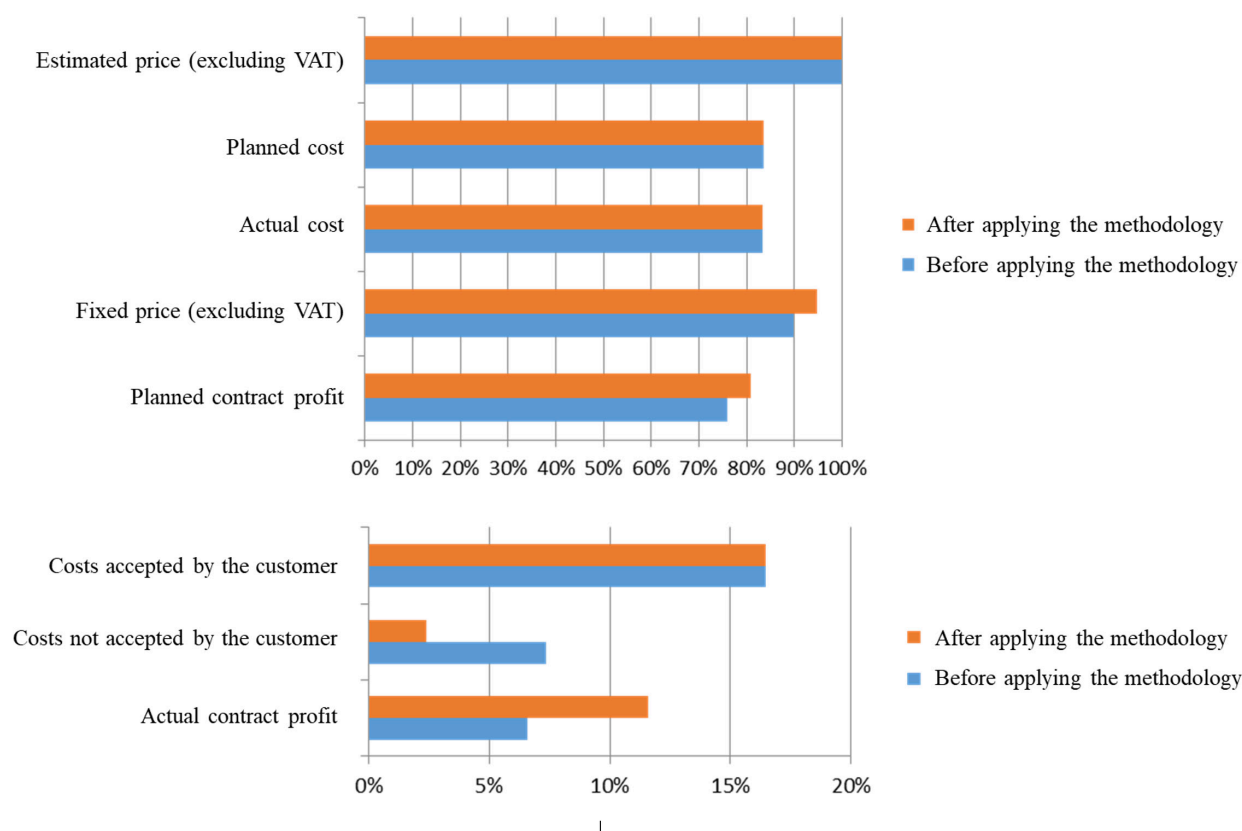


Figure 4. The effectiveness of the Methodology for intermediate checking of costs during the execution of SDO

Source: Author

$C_e = 76\% / 83\% = 0.91$ (before applying)

$C_e = 81\% / 83\% = 0.97$ (after applying)

As a result, we determine the methods of practical application of author's models for not only SDO industries.

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CONFLICT OF INTEREST

The author declares no conflict of interest.

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