Methodology for the Formation of an Information and Analytical Model of Accounting for the Costs of Occupational Safety and Health

Inara E. Sarybayeva
Republican Research Institute for Occupational Safety and Health of the Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan, Astana, 010000, Kazakhstan

Aiman S. Iskakova *
Republican Research Institute for Occupational Safety and Health of the Ministry of Labor and Social Protection of the Population of the Republic of Kazakhstan, Astana, 010000, Kazakhstan

Abstract

This paper presents a methodology for developing an information-analytical model for accounting occupational safety and health (OSH) costs in high-risk industries. The proposed approach provides a formalized and unified framework for recording, analyzing, and forecasting OSH-related expenditures, integrating both direct and indirect costs. Based on statistical data from Kazakhstan's enterprises in mining, energy, and manufacturing sectors, the methodology enables enterprises to evaluate the effectiveness of preventive measures, optimize resource allocation, and align financial planning with regulatory and social requirements. The model incorporates mathematical algorithms, including regression-based forecasting and efficiency indicators such as return on investment (ROI) and cost per employee, while also allowing sectoral adjustments through risk coefficients. The practical significance of the methodology lies in its ability to increase transparency of OSH costs, identify economically unjustified expenses, and support strategic decision-making in occupational risk management. Implementation of this model contributes to improving workplace safety, reducing occupational accidents and diseases, and strengthening socially responsible and sustainable development practices at the enterprise level.

Keywords

Occupational safety and health (OSH), cost accounting, information-analytical model, high-risk industries, occupational risk management, preventive measures, cost-effectiveness, ROI, Kazakhstan, sustainable development.