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ORGANIZATION OF THE COST ACCOUNTING SYSTEM FOR OCCUPATIONAL SAFETY AND HEALTH AT THE PRESENT STAGE

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Abstract. This article examines the key aspects of organizing a system for accounting occupational health and safety costs at the present stage, emphasizing the importance of this process in ensuring worker safety and achieving economic efficiency for enterprises. The accounting of occupational health and safety costs goes beyond financial management and becomes a critical element of strategic management aimed at reducing production risks and improving working conditions. The article highlights international practices, including the analysis of direct and indirect costs related to occupational health and safety, such as expenses for equipment, training, medical examinations, as well as productivity losses and worker recovery.

Particular attention is given to how the accounting of occupational health and safety costs contributes to increasing company profitability by reducing workplace injuries and accidents. The evaluation of the return on investment in safety measures and their impact on the financial performance of companies is considered a vital risk management tool. The article also emphasizes the role of compliance with occupational health and safety regulations and standards, which significantly affect the organization of production processes and the company's reputation.

Thus, effective accounting of occupational health and safety costs is a crucial tool for enhancing workplace safety, ensuring compliance with legal requirements, and securing the long-term sustainability of the enterprise.

Keywords: occupational health and safety, cost accounting, safety, workplace injuries, profitability, investments, standards.

Main provisions. This article analyzes the organization of occupational safety and health (OSH) cost accounting systems, emphasizing their strategic role in enhancing workplace safety and enterprise efficiency. The study reveals that in Kazakhstan, OSH expenditures remain predominantly compensation-oriented, while preventive measures such as risk assessment, training, and medical examinations are underfunded. Comparative analysis and ROI modeling demonstrate that preventive investments generate higher financial returns (up to 108%) and significantly reduce accident-related costs. The authors propose a risk-based cost accounting model that links safety expenditures to workplace hazards, improving transparency, compliance, and long-term sustainability of enterprises.

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Introduction. The modern workplace is a continuously evolving environment where employee health, safety, and well-being are top priorities. Beyond ethical responsibility, organizations increasingly recognize the financial impact of OSH. Effective accounting of OSH costs provides a detailed understanding of the financial aspects of safety, supports budgeting and resource allocation, and enables evaluation of the return on investment (ROI) in preventive measures. In addition, accurate cost accounting is essential for compliance with regulatory requirements, simplifying audits and inspections, and ensuring adherence to industry safety standards across sectors such as construction, manufacturing, and chemical processing.

The key issue is the lack of a systematic and standardized approach to OSH cost accounting, which hinders effective risk management and resource optimization. Many organizations struggle to incorporate cost accounting into strategic planning, resulting in inefficiencies and compliance challenges. Incomplete assessment of direct and indirect costs - such as expenses for protective equipment, training, or medical examinations - prevents accurate evaluation of ROI and limits opportunities to strengthen workplace safety and financial performance.

The purpose of this article is to analyze OSH cost accounting systems at the present stage, emphasizing their role in enhancing workplace safety and improving enterprise efficiency. The study examines international practices in accounting for direct and indirect costs, including equipment, training, medical examinations, and productivity losses. By evaluating ROI in safety measures, the research highlights the strategic importance of integrating OSH cost accounting into corporate risk management and decision-making.

OSH has become a global priority, as workplace accidents entail not only human risks but also financial and reputational consequences [1]. Effective management requires structured cost accounting to allocate resources efficiently, comply with regulations, and support productivity. International research underlines the importance of accounting for both direct and indirect costs and the need for transparency in OSH expenditures [2]. However, many enterprises still lack well-defined methodologies for integrating these costs into financial and operational planning. In countries such as Kazakhstan, efforts are underway to align OSH policies with international best practices established by the International Labour Organization (ILO) and the International Social Security Association (ISSA) [3]. Yet the absence of standardized procedures for cost accounting reduces the effectiveness of safety investments [4]. This study seeks to address these gaps by analyzing accounting methods, identifying key challenges, and proposing a comprehensive approach that improves workplace safety and ensures financial sustainability.

Literary review. The analysis of recent studies shows that cost accounting for OSH has evolved from a purely financial task into a key component of corporate sustainability and risk management. Researchers increasingly emphasize the need to evaluate both direct and indirect costs of workplace hazards and to quantify the economic benefits of preventive measures.

Moyano et al. investigated the possible health effects of ultrasound exposure and classified such physical factors as underestimated occupational risks, drawing attention to the lack of systematic accounting for the costs of monitoring and preventive controls [5]. Their study highlights that the accounting of OSH expenditures should integrate biomedical and environmental dimensions that remain largely invisible in current cost structures.

Rikhardsson conducted a comprehensive review of accounting methods for health and safety costs and concluded that most organizations still fail to record indirect losses, such as



productivity decline, absenteeism, and turnover [6]. He proposed a managerial accounting approach that categorizes expenditures into preventive, corrective, and compensatory blocks - an approach that aligns well with the logic of strategic decision-making in high-risk sectors.

Mustard and Yanar provided quantitative evidence that OSH investments yield measurable financial returns for employers, demonstrating that firms with structured preventive programs achieve higher profitability through reductions in accident frequency and compensation costs [7]. Their findings confirm the need to include ROI and cost-benefit indicators within OSH accounting frameworks.

At the project level, Wirahadikusumah and Adhiwira analyzed the cost of implementing occupational safety and health management system (OSHMS) regulations in construction projects and found that training, audits, and documentation constitute significant cost components [8]. Yet these expenditures ensure long-term savings by reducing incident rates - supporting the economic rationale for regulatory compliance.

From a macroeconomic perspective, Shalini demonstrated that indirect economic losses from occupational accidents in small island economies often surpass direct medical or insurance costs [9]. Similarly, Hola modeled accident rate growth in the construction industry and showed that safety performance depends not only on technical measures but also on organizational maturity and safety culture [10]. These studies emphasize that financial models of OSH should incorporate dynamic and behavioral factors influencing accident probability.

Zaloshnja and Miller extended the cost-of-accident framework to the infrastructure level, proving that preventive investment in safer road conditions produces high social returns [11]. Their findings support the inclusion of external environmental factors in enterprise-level cost accounting to reflect total risk exposure.

Boden and Galizzi analyzed long-term economic consequences of occupational injuries, including loss of income and inadequacy of compensation benefits, revealing that most enterprises underestimate the persistence of financial losses after accidents [12]. Meanwhile, Brody, Letourneau, and Poirier's indirect cost theory demonstrated that hidden, unrecorded losses - rework, quality defects, administrative delays - form the largest portion of total accident-related costs [13]. This theoretical model underscores the need to capture indirect and intangible costs within comprehensive accounting systems.

Despite significant international progress in measuring the economic impact of occupational accidents and preventive investments, several gaps remain evident.

Existing studies primarily focus on specific sectors (construction, manufacturing) or individual cost components, without developing an integrated model linking preventive expenditures with financial performance indicators across all cost categories.

Most approaches emphasize measurement rather than allocation: there is still no unified risk-based cost allocation methodology that connects OSH expenditures to the level of occupational risk at each workplace.

Research rarely addresses the adaptation of international accounting models to national contexts, particularly in developing economies such as Kazakhstan, where compensation-oriented spending still dominates enterprise budgets.

Finally, while ROI analyses are increasingly applied, they often neglect the institutional and legal dimensions of cost accounting, including tax treatment, reporting standards, and ERP integration mechanisms.

The current research fills these gaps by developing and testing a risk-based OSH cost accounting model that directly links preventive expenditures to hazard profiles and evaluates their effectiveness through ROI and productivity indicators. By combining financial, regulatory, and organizational analysis, the study provides a comprehensive framework for



integrating occupational safety costs into strategic enterprise management and national policy design.

Materials and methods. The research employs a mixed-method approach combining quantitative, qualitative, and modeling techniques to analyze the organization of OSH cost accounting systems.

Quantitative analysis was based on statistical data from the Bureau of National Statistics of Kazakhstan and financial reports of 10 enterprises operating in high-risk sectors (mining, construction, and manufacturing) for 2020–2024. Comparative analysis was applied to evaluate two models of OSH cost accounting: a traditional cost aggregation model and a risk-based cost allocation model. For example, ROI was calculated using the standard formula:

$$ROI = \frac{Cost\ savings - Investments}{Investments} \times 100 \quad (1)$$

At a pilot mining enterprise, preventive expenditures of 48 million KZT on ventilation systems and protective equipment resulted in annual savings of 71 million KZT due to reduced accident costs, yielding an ROI of 47.9%.

Qualitative research included 20 semi-structured expert interviews: 8 with occupational safety specialists, 6 with chief accountants/financial managers, and 6 with enterprise directors. The experts represented the mining, metallurgy, and construction industries. These interviews revealed barriers to integrating OSH costs into financial strategies, such as underestimation of indirect costs and insufficient linkage between safety and productivity indicators.

Case studies were developed for three enterprises:

- Case A (Mining sector) - assessment of cost-effectiveness of PPE and training programs;
- Case B (Construction sector) - analysis of OSH training modules and accident reduction outcomes;
- Case C (Manufacturing sector) - evaluation of integration of OSH expenditures into ERP accounting systems.

The names of the enterprises are encrypted, as their expenditure data constitutes confidential information.

Economic modeling was used to project the long-term impact of OSH investments. Simulation models showed that a 10% increase in preventive expenditures annually could reduce accident-related costs by 15–20% within five years, with a parallel increase in labor productivity of up to 4%.

Regulatory analysis was conducted based on Kazakhstan's Labor Code (2015), the Concept of Safe Labour (2024–2030), and international standards (ILO Conventions No. 155, 187; ISO 45001), to evaluate compliance requirements for OSH cost reporting.

By combining statistical analysis, ROI modeling, case studies, and regulatory assessment, the study provides a structured methodological framework for OSH cost accounting that links safety improvements with financial sustainability and regulatory compliance.

Results and discussion. The EU Member States conduct statistical observations according to EU methodology. Reporting is regulated by Regulation (EC) No. 1338/2008 of the European Parliament and Council of 16 December 2008 and Commission Regulation (EU) No. 349/2011 of 11 April 2011 on statistics on accidents at work (ESAW).



According to the ILO Labour Statistics Convention (1985), basic labour statistics, including occupational injuries and diseases, must be collected and published annually, disaggregated by economic activity and worker characteristics (sex, age, occupation, skill level).

A key outcome of EU OSH policy coordination has been the creation of a unified methodology for collecting, monitoring, and analyzing accident data. Harmonized statistics are compiled under ESAW, based on the methodology first published in 1992, and supplemented by Labour Force Survey (LFS) modules and European Occupational Diseases Statistics (EODS). These provide additional data on short absences, return to work, and work-related health problems [14].

Within ESAW, variables are recorded for analyzing systemic causes and circumstances of accidents across industries. The EU-OSHA Occupational Safety and Health Barometer includes indicators on:

1. General information;
2. OSH management;
3. OSH outcomes and working conditions;
4. OSH infrastructure.

Statistics on accidents, health impacts, and effects of physical/psychosocial risk factors belong to the third category. In 2022, the EU registered 2.97 million non-fatal accidents with ≥ 4 days absence and 3,286 fatal accidents (table 1), or about 905 non-fatal cases per fatality.

Table 1 - Number of non-fatal and fatal accidents at work in the EU, 2022

Countries	Non-fatal accidents at work involving at least 4 calendar days of absence from work			Fatal accidents at work
	Total	Men	Women	Total
EU	2 973 646	1 969 779	1 003 046	3 286
Belgium	61 164	42 703	18 460	45
Bulgaria	2 044	1 333	711	83
Czechia	36 029	24 182	11 830	88
Denmark	110 668	41 923	68 429	41
Germany	791 319	582 822	208 211	397
Estonia	5 301	3 727	1 574	15
Ireland	20 404	13 024	7 264	25
Greece	4 824	3 430	1 394	25
Spain	497 832	340 327	157 504	411
France	622 538	381 528	241 009	775
Croatia	10 068	6 307	3 756	48
Italy	330 131	209 908	120 223	469
Cyprus	1 326	992	334	9
Latvia	2 319	1 482	837	29
Lithuania	4 699	2 923	1 697	32
Luxembourg	6 447	4 972	1 475	12
Hungary	25 289	16 030	9 259	70
Malta	1 564	1 244	320	15
Netherlands	84 831	54 543	30 288	25
Austria	55 152	42 942	12 210	109
Poland	66 397	40 591	25 806	180
Portugal	125 607	87 708	37 899	141
Romania	3 173	2 185	988	127



continuation of table 1

Slovenia	16 023	9 227	6 796	17
Slovakia	7 925	5 078	2 847	31
Finland	35 743	23 748	11 995	27
Sweden	44 829	24 901	19 928	40
Iceland	1 328	897	430	1
Norway	10 854	6 392	4 462	31
Switzerland	94 739	72 688	22 051	58
Note: compiled by the authors based on [15, 16]»				

From 2021 to 2022, the EU recorded 87,139 more non-fatal workplace accidents (+3.0%), partly due to the post-COVID return to workplaces. Fatal accidents fell by 61 cases (–1.8%). Men accounted for 66.2% of non-fatal accidents, reflecting their higher employment in high-risk industries (mining, manufacturing, construction) and predominance in full-time jobs. While non-fatal accidents among men decreased slightly (–519), cases involving women rose sharply (+87,929).

Overall, the EU shows a divergent trend: rising non-fatal but declining fatal accidents. A comparison with Kazakhstan highlights similar fluctuations. According to the Bureau of National Statistics [8], 2,471 workers were registered as occupational accident victims in 2024-up by 438 cases from 2020, but down by 199 from 2023 (figure 1).

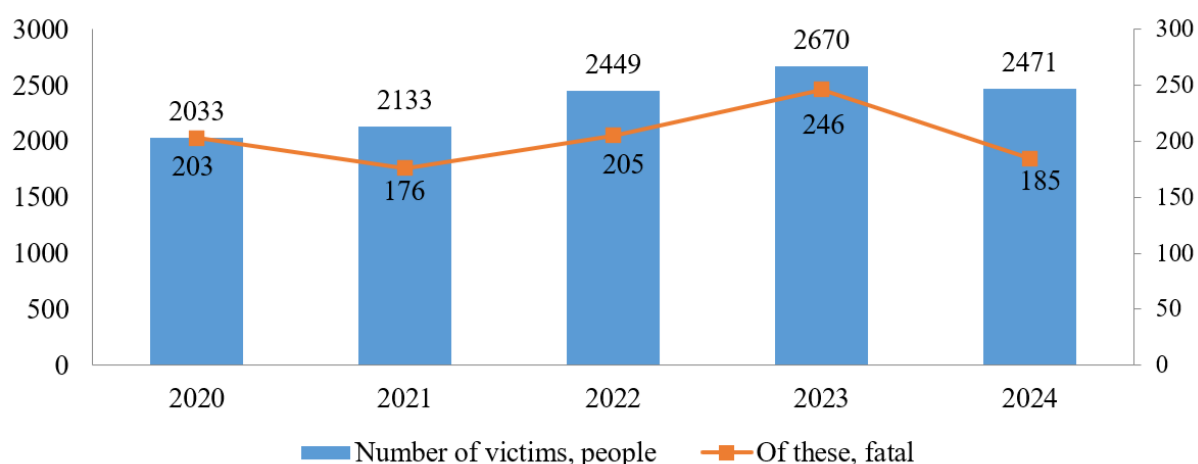


Figure 1 – Number of victims of occupational accidents, including fatal cases, in the Republic of Kazakhstan for 2020–2024

Note: compiled by the authors based on data from [17]

During 2021–2023, the number of occupational accident victims in Kazakhstan increased, partly due to post-pandemic production growth and expanded statistical coverage. In 2024, cases fell by 7.5%, yet remained above 2020–2021 levels.

From 2020 to 2024, female injuries rose by 25.8% (from 400 to 503), driven by greater participation in high-risk sectors (construction, industry, transport), poor PPE adaptation for women, and safety non-compliance. Fatalities also fluctuated—from 203 in 2021 to 185 in 2024—though mortality remains above early 2000s levels, underscoring the need to strengthen accident recording, analysis, and prevention.



In 2024, enterprises spent KZT 434,541.2 million on hazardous work conditions, 68.4% of which went to social guarantees such as extra leave, shorter hours, preventive nutrition, and wage supplements (figure 2).

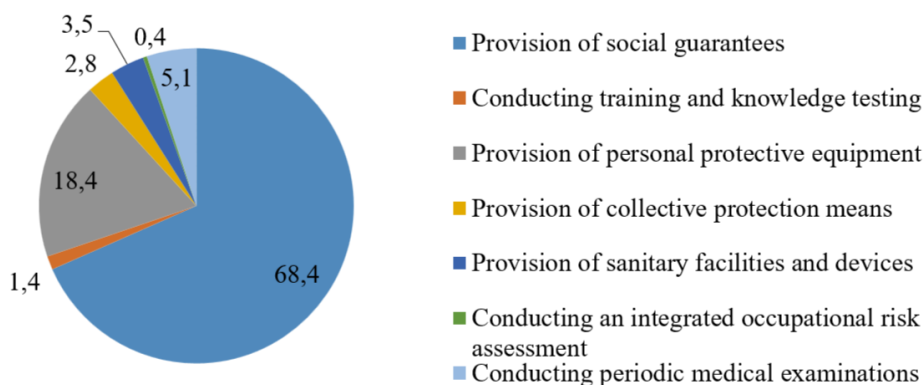


Figure 2 – Structure of enterprise expenditures on occupational safety and health in the Republic of Kazakhstan in 2024, %

Note: compiled by the authors based on [17]

The second largest share of expenditures is PPE provision (18.4%), a key preventive measure. Yet only 0.4% is directed to integrated occupational risk assessment, which could identify and eliminate hazards before accidents and diseases occur.

The data show a bias toward compensatory rather than preventive measures. International practice indicates that reallocating funds to systematic prevention can reduce injuries, lower economic losses, and improve the efficiency of OSH investments.

Beyond finance, OSH cost accounting ensures resources for safety, fosters responsibility, and supports proactive risk management. By evaluating costs and effectiveness, organizations can improve safety measures and create healthier workplaces.

Thus, OSH cost accounting is not merely financial management but a strategic tool for worker well-being, compliance, and organizational sustainability. The objectives of such accounting are summarized in Table 2.

Table 2 - Objectives of occupational health and safety cost accounting

№	Objective	Content
1	Cost control	Accounting for occupational health and safety costs enables organizations to effectively monitor and manage their safety-related expenses. This includes budgeting, resource allocation, and strategies for reducing overall costs associated with workplace safety.
2	Risk management	Detailed accounting allows organizations to identify areas with higher safety risks, enabling them to allocate resources toward risk reduction and accident prevention.
3	Transparency and compliance	This ensures transparency in occupational health and safety costs, which is often a legal requirement. Transparency, in turn, promotes compliance with regulatory standards, helping organizations avoid legal issues and financial penalties.
4	Evaluation of effectiveness	By taking occupational health and safety costs into account, organizations can objectively assess the effectiveness of their safety measures and programs. This data-driven approach enables organizations to make informed decisions, continuously improving workplace safety.

Note: compiled by the authors



The employer must, at their own expense, provide employees with occupational safety training, while employees are obliged to undergo such training and assessments. Managers and responsible persons must complete training and knowledge assessments at least once every three years through accredited organizations.

Example: The company paid KZT 200,000 for an employee's safety training. Expenses may be reflected either directly to account 7210 (D 7210 C 3310) or via account 3350 (D 7210 C 3350, D 3350 C 3310), depending on the Accounting Policy.

According to subparagraph 25) paragraph 1 of Article 341 and Article 257 of the Tax Code of the Republic of Kazakhstan, employer-paid training related to production activities is deductible from taxable income and should be reflected in line 100.00.019 of section IV of Form 100.00 (FNO 100.00).

Additionally, legislation obliges employers to ensure sanitary and hygienic conditions, provide and repair special clothing and footwear, supply preventive nutrition, cleaning and disinfecting agents, and issue PPE. Special clothing includes garments, footwear, headgear, gloves, and other protective equipment safeguarding workers from harmful and hazardous factors.

For the accounting of special clothing, the following legal and regulatory acts should be adhered to:

The Labor Code of the Republic of Kazakhstan dated November 23, 2015, No. 414-V (hereinafter referred to as the Labor Code);

Order of the Minister of Health and Social Development of the Republic of Kazakhstan dated December 8, 2015, No. 943 «On the Approval of Norms for the Provision of Special Clothing and Other Personal Protective Equipment to Employees of Organizations in Various Economic Sectors» (hereinafter referred to as the Order on the Approval of Special Clothing Norms);

Order of the Minister of Health and Social Development of the Republic of Kazakhstan dated December 28, 2015, No. 1054 «On the Approval of the Rules for Providing Workers with Milk or Equivalent Food Products and/or Specialized Products for Dietary (Therapeutic and Preventive) Nutrition, Special Clothing and Other Personal Protective Equipment, Providing Them with Collective Protection Equipment, Sanitary and Domestic Premises, and Facilities at the Employer's Expense»;

The Tax Code of the Republic of Kazakhstan dated December 25, 2017, No. 120-VI «On Taxes and Other Mandatory Payments to the Budget» (hereinafter referred to as the Tax Code);

Order of the Minister of Finance of the Republic of Kazakhstan dated May 23, 2007, No. 185 «On the Approval of the Standard Chart of Accounts for Accounting»;

Order of the Minister of Finance of the Republic of Kazakhstan dated December 20, 2012, No. 562 «On the Approval of Forms for Primary Accounting Documents» (hereinafter referred to as Order No. 562).

In addition to legal acts, accounting for special clothing also relies on internal company regulations, primary documents, and the organization's accounting and tax policies. The Accounting Policy defines principles for industries with high occupational risk, ensuring reliable financial reporting in accordance with IFRS (IAS, IFRIC, SIC). Its provisions are mandatory, deviations are not allowed, and compliance is reviewed annually. Changes in IFRS require timely policy updates, with their consequences reflected in financial statements under «Changes in Accounting Policies, Estimates, and Errors».



In the statement of comprehensive income, performance measurement includes:

Expenses: outflows or reductions in assets, leading to a decrease in net assets.

Borrowing costs: excluded from inventory costs and recognized as financial expenses.

The Accounting Policy must also reflect treatment of inventories: surpluses identified during stocktaking are recorded at acquisition cost or market value; components from disposal of assets are recognized at zero and off-balance sheet. According to IFRS (IAS) 2, inventories are measured at the lower of cost or net realizable value.

Inventory and household supplies include special/sanitary clothing, footwear, tools, and devices, regardless of useful life. They are considered in use once issued from the warehouse. Write-offs occur when items become unusable, are lost/damaged, or when their useful life is ≤ 1 year. Items with a longer life are depreciated over their useful period and reclassified as «Inventories in Use».

Movements of inventories between divisions, as well as transfers for safekeeping or processing, are reflected in analytical accounts; ownership risks remain with the organization. If inventories become damaged, obsolete, or their sale/use value falls below cost, they are written down to net realizable value, with losses recognized as expenses.

Analysis of OSH expenditures at six enterprises (Cases A–C) shows that most resources are spent on compensatory measures-reduced working hours, extra leave, wage supplements-while preventive actions (risk assessments, training, medical examinations) remain underfunded (Table 3).

Table 3 - Results of the analysis for OSH costs at 6 enterprises (A-C) for 2020-2024

Type of costs (thousand tenge)	A	B	C
The cost of conducting an occupational risk assessment	11 676,00	8 299,20	5 845,00
Costs of certification of production facilities according to working conditions	12 750,00	3 341,25	3 600,00
The costs of conducting training, instruction and knowledge testing on occupational safety issues for employees, managers and persons responsible for ensuring occupational safety	18 217,00	9 167,04	3 984,60
The costs of compulsory insurance of an employee against accidents in the performance of his labor (official) duties	106 136,60	293 032,45	105546,00
Costs of providing personal protective equipment	141 569,80	63 275,54	62 811,60
The cost of providing collective protection	-	62 281,76	-
Costs of providing sanitary facilities and devices	55 752,60	10 703,88	17 223,70
The cost of providing employees with milk or equivalent food products and (or) specialized products for dietary (therapeutic and preventive) nutrition	37 466,20	540 975,36	305212,50
The cost of providing reduced working hours, additional paid annual leave and increased wages	2192898,70	284 858,78	915959,50
The cost of periodic medical examinations and pre-shift medical examination of employees	8 773,70	47 675,09	-
The cost of paying mandatory occupational pension contributions	208 757,40	-	143099,70
* given on average for 5 years			
Note: compiled by the authors based on company data			

To evaluate the economic efficiency of OSH spending, comparative models were applied. The traditional cost aggregation model records OSH expenditures as a homogeneous block within general production costs, limiting opportunities for analyzing their impact on



safety outcomes. In contrast, the risk-based cost allocation model distributes costs according to identified workplace hazards and risk levels, thereby linking expenditures directly to preventive efficiency.

Example of ROI calculation:

At enterprise A (mining sector), preventive investments of 48 million KZT in ventilation systems and PPE yielded annual savings of 71 million KZT due to reductions in accident-related costs, producing an ROI of 47.9%. The calculation is as follows:

$$ROI = \frac{\text{Cost savings} - \text{Investments}}{\text{Investments}} \times 100 = \frac{71 - 48}{48} \times 100 = 47,9\% \quad (2)$$

Case B (construction sector): Investments of 12.5 million KZT in workplace certification and 9.2 million KZT in training resulted in a 22% reduction in accident frequency over three years, which translated into savings of 35 million KZT. The ROI reached 108%, confirming the high efficiency of combining training programs with certification measures.

Case C (manufacturing sector): While 305 million KZT were spent on providing dietary support (milk and preventive nutrition), this category had no measurable effect on accident reduction. In comparison, a modest investment of 5.8 million KZT in occupational risk assessment produced savings of 11.2 million KZT in avoided accident costs, yielding an ROI of 93%. This case highlights the inefficiency of compensation-heavy strategies and demonstrates the superior cost-effectiveness of preventive measures.

Simulation modeling further confirmed these trends. Projections show that a 10% annual increase in preventive expenditures can reduce accident-related costs by 15–20% within five years and improve labor productivity by up to 4%. Thus, reallocating resources toward preventive programs such as risk assessment, medical monitoring, and safety training ensures higher financial returns and more sustainable improvements in workplace safety.

Overall, these findings underscore that the effectiveness of OSH cost accounting is maximized when expenditures are strategically aligned with risk-oriented priorities. Compensation measures, while necessary, do not generate measurable long-term benefits comparable to those of prevention-focused strategies.

Conclusion. The conducted research confirmed that the existing system of OSH cost accounting in Kazakhstan is dominated by compensation-oriented expenditures, while preventive measures remain underfunded. Comparative analysis of enterprises A–C demonstrated that the majority of resources are allocated to additional leave, reduced working hours, and compensatory wage increases, whereas investments in risk assessment, training, and medical examinations show much higher efficiency when evaluated by ROI indicators. For instance, preventive measures achieved ROI levels of 47–108%, clearly surpassing compensation-heavy strategies with negligible long-term effects.

Theoretical significance. The study expands the conceptual understanding of OSH cost accounting by introducing a risk-based allocation model that directly links expenditures to workplace hazards. This approach goes beyond the traditional aggregation of costs and provides a framework for assessing the effectiveness of safety investments, thus integrating OSH into broader corporate risk management and strategic planning.

Practical significance. The findings demonstrate that enterprises can substantially increase both economic and social returns by reallocating resources from compensatory benefits toward preventive programs. The simulation model confirms that a 10% annual



increase in preventive expenditures can reduce accident-related costs by 15–20% and enhance labor productivity by up to 4% over five years.

Practical recommendations for enterprises:

1. Introduce a structured OSH cost accounting system within the corporate accounting policy, ensuring separation of compensatory and preventive expenditures.
2. Apply ROI and cost-benefit analysis as mandatory tools for evaluating the effectiveness of OSH programs, prioritizing measures with proven economic returns.
3. Adopt a risk-based cost allocation model, linking budget lines to identified hazards and levels of occupational risk at specific workplaces.
4. Integrate OSH expenditures into ERP and financial reporting systems, ensuring transparency and compliance with both national legislation and international standards (ILO, ISSA, ISO 45001).
5. Develop a phased implementation roadmap, beginning with pilot projects in high-risk industries (mining, construction, manufacturing), followed by scaling preventive accounting practices across other sectors.

In summary, the proposed risk-oriented system of OSH cost accounting not only enhances compliance and transparency but also creates strong economic incentives for enterprises to prioritize prevention over compensation. This shift can significantly reduce workplace accidents, strengthen financial sustainability, and contribute to the long-term well-being of the workforce.

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Literature cited

1. Kineber A. F. et al. Benefits of implementing occupational health and safety management systems for the sustainable construction industry: a systematic literature review // *Sustainability*. – 2023. – Vol. 15. - No. 17. – P. 12697. DOI: 10.3390/su151712697.
2. Adamopoulos I. P., Syrou N. F. Workplace safety and occupational health job risks hazards in public health sector in Greece // *European Journal of Environment and Public Health*. – 2022. – Vol. 6. - No. 2. – P. em0118. DOI: 10.21601/ejeph/12176.
3. Shah I. A., Mishra S. D. Artificial intelligence in advancing occupational health and safety: an encapsulation of developments // *Journal of Occupational Health*. – 2024. – Vol. 66. - No. 1. – P. uiad017. DOI: 10.1093/joh/uiad017.
4. Park J. S. et al. Human-focused digital twin applications for occupational safety and health in workplaces: a brief survey and research directions // *Applied Sciences*. – 2023. – Vol. 13. - No. 7. – P. 4598. DOI: 10.3390/app13074598.
5. Moyano D. B., Paraiso D. A., González-Lezcano R. A. Possible effects on health of ultrasound exposure, risk factors in the work environment and occupational safety review // *Healthcare*. – 2022. – Vol. 10. - No. 3. – P. 423. DOI: 10.3390/healthcare10030423.
6. Rikhardsson P. Accounting for Health and Safety Costs: Review and Comparison of Selected Methods // *University of Aarhus, Aarhus School of Business, Department of Business Studies, Management Accounting Research Group Working Papers*. – Aarhus, 2005. DOI: 10.1007/978-1-4020-4974-3_6.
7. Mustard C., Yanar B. Estimating the financial benefits of employers' occupational health and safety expenditures // *Safety Science*. – 2023. – Vol. 159. – e.106008. DOI: 10.1016/j.ssci.2022.106008.
8. Wirahadikusumah R., Adhiwira F. The cost of implementing OSHMS regulation on high-rise building projects // *MATEC Web of Conferences*. – 2019. – Vol. 270. – e.05007. DOI: 10.1051/mateconf/201927005007.



9. Shalini R. T. Economic cost of occupational accidents: evidence from a small island economy // *Safety Science*. – 2009. – Vol. 47. – No. 7. – P. 973–979. DOI: 10.1016/j.ssci.2008.10.021.
10. Hola B. General model of accident rate growth in the construction industry // *Journal of Civil Engineering and Management*. – 2007. – Vol. 13. – No. 4. – P. 255–264.
11. Zaloshnja E., Miller T. R. Cost of crashes related to road conditions, United States, 2006 // *Annals of Advances in Automotive Medicine*. – 2009. – Vol. 53. – P. 141–153.
12. Boden L. I., Galizzi M. Economic consequences of workplace injuries and illnesses: Lost earnings and benefit adequacy // *American Journal of Industrial Medicine*. – 1999. – Vol. 36. – No. 5. – P. 487–503. DOI: 10.1002/(SICI)1097-0274(199911)36.
13. Brody B., Letourneau Y., Poirier A. An indirect cost theory of work accident prevention // *Journal of Occupational Accidents*. – 1990. – Vol. 13. – No. 4. – P. 255–270. DOI: 10.1016/0376-6349(90)90033-R.
14. Бекмагамбетов А. Б., Сарыбаева И. А., Турекулова А. Н., Череева Б. Т. Европейский опыт статистического мониторинга в области охраны труда // *Вестник Казахского университета экономики, финансов и международной торговли*. – 2023. – № 2 (51). – С. 52–58. DOI: 10.52260/2304-7216.2023.2(51).7.
15. Eurostat. Data browser. Bookmark 466e5c14-78e2-4b92-9a08-8d38c8134c63 [Электронный ресурс]. – Режим доступа: <https://ec.europa.eu/eurostat/databrowser/bookmark/466e5c14-78e2-4b92-9a08-8d38c8134c63?lang=en> (дата обращения: 10.02.2025).
16. Eurostat. Data browser. Bookmark c83e2b00-9da1-4646-9233-2d3853a242d9 [Электронный ресурс]. – Режим доступа: <https://ec.europa.eu/eurostat/databrowser/bookmark/c83e2b00-9da1-4646-9233-2d3853a242d9?lang=en> (дата обращения: 10.02.2025).
17. Бюро национальной статистики Агентства по стратегическому планированию и реформам Республики Казахстан. Травматизм, связанный с трудовой деятельностью, и профессиональные заболевания в Республике Казахстан (2024). – Астана, 2025 [Электронный ресурс]. – Режим доступа: <https://stat.gov.kz/ru/industries/social-statistics/stat-medicine/publications/383083/> (дата обращения: 10.02.2025).

References

1. Kineber A. F. et al. Benefits of implementing occupational health and safety management systems for the sustainable construction industry: a systematic literature review. *Sustainability*, 2023, 15(17), pp. 12697. DOI: 10.3390/su151712697.
2. Adamopoulos I. P., Syrou N. F. Workplace safety and occupational health job risks hazards in public health sector in Greece. *European Journal of Environment and Public Health*, 2022, 6(2), em0118. DOI: 10.21601/ejeph/12176.
3. Shah I. A., Mishra S. D. Artificial intelligence in advancing occupational health and safety: an encapsulation of developments. *Journal of Occupational Health*, 2024, 66(1), uiad017. DOI: 10.1093/joh/uiad017.
4. Park J. S. et al. Human-focused digital twin applications for occupational safety and health in workplaces: a brief survey and research directions. *Applied Sciences*, 2023, 13(7), e.4598. DOI: 10.3390/app13074598.
5. Moyano D. B., Paraiso D. A., González-Lezcano R. A. Possible effects on health of ultrasound exposure, risk factors in the work environment and occupational safety review. *Healthcare*, 2022, 10(3), pp. 423. DOI: 10.3390/healthcare10030423.
6. Rikhardsson P. Accounting for health and safety costs: Review and comparison of selected methods. *University of Aarhus, Aarhus School of Business, Department of Business Studies, Management Accounting Research Group Working Papers*, Aarhus, 2005. DOI: 10.1007/978-1-4020-4974-3_6.
7. Mustard C., Yanar B. Estimating the financial benefits of employers' occupational health and safety expenditures. *Safety Science*, 2023, 159, e.106008. DOI: 10.1016/j.ssci.2022.106008.
8. Wirahadikusumah R., Adhiwira F. The cost of implementing OSHMS regulation on high-rise building projects. *MATEC Web of Conferences*, 2019, 270, e.05007. DOI: 10.1051/mateconf/201927005007.
9. Shalini R. T. Economic cost of occupational accidents: evidence from a small island economy. *Safety Science*, 2009, Vol. 47, No. 7, pp. 973–979. DOI: 10.1016/j.ssci.2008.10.021.
10. Hola B. General model of accident rate growth in the construction industry. *Journal of Civil Engineering and Management*, 2007, Vol. 13, No. 4, pp. 255–264.



11. Zaloshnja E., Miller T. R. Cost of crashes related to road conditions, United States, 2006. *Annals of Advances in Automotive Medicine*, 2009, 53, pp. 141–153.
12. Boden L. I., Galizzi M. Economic consequences of workplace injuries and illnesses: Lost earnings and benefit adequacy. *American Journal of Industrial Medicine*, 1999, 36(5), pp. 487–503. DOI: 10.1002/(SICI)1097-0274(199911)36.
13. Brody B., Letourneau Y., Poirier A. An indirect cost theory of work accident prevention. *Journal of Occupational Accidents*, 1990, 13 (4), pp. 255–270. DOI: 10.1016/0376-6349(90)90003.
14. Bekmagambetov A. B., Sarybayeva I. A., Turekulova A. N., Chereyeva B. T. Evropeiskii opyt statisticheskogo monitoringa v oblasti okhrany truda [European experience of statistical monitoring in the field of labor protection]. *Vestnik Kazakhskogo universiteta ekonomiki, finansov i mezhdunarodnoi trgovli*, 2023, 2 (51), pp. 52–58. DOI: 10.52260/2304-7216.2023.2(51).7 (in Russian).
15. Eurostat. Data browser. Bookmark 466e5c14-78e2-4b92-9a08-8d38c8134c63. Available at: <https://ec.europa.eu/eurostat/databrowser/bookmark/466e5c14-78e2-4b92-9a08-8d38c8134c63?lang=en> (accessed 10.02.2025).
16. Eurostat. Data browser. Bookmark c83e2b00-9da1-4646-9233-2d3853a242d9. Available at: <https://ec.europa.eu/eurostat/databrowser/bookmark/c83e2b00-9da1-4646-9233-2d3853a242d9?lang=en> (accessed 10.02.2025).
17. Byuro natsionalnoi statistiki Agentstva po strategicheskemu planirovaniyu i reformam Respubliki Kazakhstan. Travmatizm, svyazannyi s trudovoi deiatelnosti, i professionalnye zabolevaniya v Respublike Kazakhstan (2024) [Injuries related to labor activity and occupational diseases in the Republic of Kazakhstan (2024)]. Astana, 2025. Available at: <https://stat.gov.kz/ru/industries/social-statistics/stat-medicine/publications/383083/> (accessed 10.02.2025) (in Russian).

ҚАЗІРГІ КЕЗЕҢДЕ ЕҢБЕКТІ ҚОРҒАУҒА АРНАЛҒАН ШЫҒЫНДАРДЫ ЕСЕПКЕ АЛУ ЖҮЙЕСІН ҰЙЫМДАСТЫРУ

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² Қазақстан Республикасы Еңбек және халықты әлеуметтік қорғау министрлігінің Еңбекті қорғау жөніндегі республикалық ғылыми-зерттеу институты, Астана, Қазақстан

Түйін. Мақалада қазіргі кезеңде еңбек қорғау шығындарын есепке алу жүйесін ұйымдастырудың негізгі қырлары қарастырылып, бұл үдерістің жұмыскерлердің қауіпсіздігін қамтамасыз етуде және кәсіпорындардың экономикалық тиімділігін арттырудағы маңыздылығы атап өтіледі. Еңбек қорғауға жұмсалатын шығындарды есепке алу қаржылық менеджмент шеңберінен шығып, өндірістік тәуекелдерді төмендетуге және еңбек жағдайларын жақсартуға бағытталған стратегиялық басқарудың маңызды элементіне айналады. Халықаралық тәжірибелерге, соның ішінде еңбек қорғаумен байланысты тікелей және жанама шығындарды талдауға ерекше назар аударылады. Олардың қатарына жабдыққа, оқытуға, медициналық тексерулерге жұмсалатын шығындар, сондай-ақ еңбек өнімділігінің төмендеуі мен жұмыскерлерді қалпына келтіру шығындары жатады.

Еңбек қорғау шығындарын есепке алу өндірістік жарақаттар мен жазатайым оқиғаларды азайту арқылы кәсіпорынның табыстылығын арттыруға ықпал ететіні ерекше көрсетілген. Қауіпсіздік шараларына салынған инвестициялардың қайтарымдылығын бағалау және олардың компаниялардың қаржылық нәтижелеріне әсері тәуекелдерді басқарудың маңызды құралы ретінде қарастырылады. Сонымен қатар, еңбек қорғау саласындағы нормативтік талаптар мен стандарттарды сақтау өндірістік үдерістерді ұйымдастыруға және кәсіпорын беделіне елеулі ықпал ететіні баса айтылған.

Осылайша, еңбек қорғау шығындарын тиімді есепке алу жұмыс орындарындағы қауіпсіздікті арттырудың, заңнамалық талаптарды сақтаудың және кәсіпорынның ұзақ мерзімді тұрақтылығын қамтамасыз етудің маңызды құралы болып табылады.

Түйінді сөздер: еңбекті қорғау, шығындарды есепке алу, қауіпсіздік, жарақаттану, рентабельділік, инвестициялар, стандарттар.



ОРГАНИЗАЦИЯ СИСТЕМА УЧЕТА ЗАТРАТ НА ОХРАНУ ТРУДА НА СОВРЕМЕННОМ ЭТАПЕ

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Резюме. В статье рассматриваются ключевые аспекты организации системы учета затрат на охрану труда на современном этапе, подчеркивается значимость данного процесса для обеспечения безопасности работников и достижения экономической эффективности предприятий. Учет затрат на охрану труда выходит за рамки финансового менеджмента и становится важнейшим элементом стратегического управления, направленного на снижение производственных рисков и улучшение условий труда. Особое внимание уделяется международной практике, включая анализ прямых и косвенных затрат, связанных с охраной труда, таких как расходы на оборудование, обучение, медицинские осмотры, а также потери производительности и восстановление работников.

Особый акцент сделан на том, как учет затрат на охрану труда способствует росту прибыльности предприятий за счет сокращения числа производственных травм и несчастных случаев. Оценка рентабельности инвестиций в мероприятия по охране труда и их влияние на финансовые показатели компаний рассматривается как важнейший инструмент управления рисками. В статье также подчеркивается роль соблюдения нормативных требований и стандартов в области охраны труда, которые существенно влияют на организацию производственных процессов и репутацию предприятия.

Таким образом, эффективный учет затрат на охрану труда является важным инструментом повышения уровня безопасности на рабочих местах, обеспечения соответствия законодательным требованиям и укрепления долгосрочной устойчивости предприятия.

Ключевые слова: охрана труда, учет затрат, безопасность, травматизм, рентабельность, инвестиции, стандарты.

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