

MINISTRY OF EDUCATION AND SCIENCE OF
UKRAINE NATIONAL TECHNICAL UNIVERSITY
KHARKIV POLYTECHNICAL UNIVERSITY

METHODOLOGICAL INSTRUCTIONS
FOR THE IMPLEMENTATION OF THE CALCULATION AND GRAPHIC
TASK “TECHNICAL AND ECONOMIC EFFICIENCY OF MEASURES
AIMED AT IMPROVING OCCUPATIONAL SAFETY IN PRODUCTION”
FROM THE DISCIPLINE "ORGANIZATIONAL AND TECHNICAL
ENSURING THE AUDIT OF PROFESSIONAL SAFETY OF WORKPLACES
IN THE FIELD OF LABOR PROTECTION"
FOR STUDENTS OF SPECIALTY 263 "CIVIL SECURITY"

Kharkiv 2024

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Methodological instructions for the implementation of the calculation and graphic task “Technical and economic efficiency of measures aimed at improving occupational safety in production”
from the discipline "Organizational and technical ensuring the audit of professional safety of workplaces in the field of labor protection"
for students of specialty 263 "Civil Security"

Approved by the
editorial and
publishing department
protocol N 3 of 12.10.
2023.

Methodological instructions for the implementation of the calculation and graphic task “Technical and economic efficiency of measures aimed at improving occupational safety in production” : from the discipline "Organizational and technical ensuring the audit of professional safety of workplaces in the field of labor protection" for students of specialty 263 "Civil Security"/ comp.: N. S. Yevtushenko, N. Ye. Tverdokhliebova. – Kharkiv : NTU "KhPI", 2024. – 26 p.

Compilers: N. S. Yevtushenko,
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INTRODUCTION

Occupational safety audit is an independent objective assessment of the state of the enterprise's labor protection system to determine the current level of safety at the enterprise, the main tasks of which are: identifying shortcomings in the enterprise's labor protection system, labor assessment, analysis of compliance with the harmonization of labor protection documentation with the legislation of Ukraine, assessment of system effectiveness , detection of violations in the labor protection system, development of recommendations for the elimination of these violations.

The implementation of modern tasks of labor protection should be based on a systematic approach by combining disparate measures into a single system of purposeful, constantly performed actions at all levels and stages of economic activity management in the industry. The systemic effect is obtained as a result of an increase in the level of organization of the production system, its acquisition of higher integration as a result of the combination of many forces into one common one. Organization of an audit on occupational safety of workplaces, laboratory studies of working conditions, assessment of the technical condition of production equipment, certification of workplaces for compliance with regulatory legal acts on labor protection in the manner and terms specified by law, and following the results of taking measures to eliminate dangerous and harmful health factors of production will help improve health and safety in the workplace.

1. GENERAL PROVISIONS

In order to deepen the study of the academic discipline "Organizational and technical support for the audit on occupational safety of workplaces in the labor protection industry" and the acquisition of skills and abilities for independent qualified calculations, analysis and conclusions in the process of studying the discipline, students of the 5th year of the full-time form of education "Civil Security" , specialization 263-1 "Labor protection" perform settlement and graphic work (RGR).

These methodological recommendations determine the order of execution, volume, content of the RGR and the procedure for its protection.

2. REQUIREMENTS FOR THE PERFORMANCE OF THE CALCULATION AND GRAPHIC PROBLEM

The calculation and graphic task is performed on an A4 sheet in Times New Roman font, size 14 pt, line spacing - 1.5. Margins: left - 30 mm, right - 15 mm, top, bottom - 20 mm. Text alignment - in width.

The option number matches the student's serial number on the list in the group's academic journal.

The RTS structure contains the following elements:

Title page;

content (plan);

Introduction;

main part:

- theoretical question (sections, subsections, paragraphs, subparagraphs);

- settlement and graphic task;

conclusions;

List of used sources.

An example of the design of the title page is given in Appendix A.

The content includes all the names of the constituent parts of the work: introduction, theoretical questions, calculation and graphic task, conclusions, list of sources used. An example of content design is given in Appendix B.

The introduction contains the relevance of the chosen topic, the state of the study of the scientific problem, the goals and objectives of the work (volume - 2-3 pages).

In terms of content, theoretical questions can be an analytical review of certain problematic issues, their current state. The content of the CGA(calculated graphic assignment) should correspond to the topic, goals and objectives, consistently disclose all the envisaged issues, substantiate, explain the main provisions, supporting them with specific examples, facts, using the legislative framework, regulatory documents.

Introduction, sections, conclusions, bibliography should be placed on a new page. When writing a work on the text, you must specify a link to sources of information in square brackets.

In the Conclusion (2-3 pages) it is necessary to sum up the conducted research, to state its results.

The volume of the calculation and graphic task: the theoretical part - 20 - 25 sheets, the calculation and graphic task, which provides the relevant calculations and graphs - 4-5 sheets. The total amount of work is 25–30 pages.

The protected work is admission to the exam. In total, 18 hours of independent work are provided for settlement and graphic work. The CGA(calculated graphic assignment) is allowed to defend, which is verified and signed by the head. For the report, the student is given up to 5 minutes. After the report, the student answers the questions of the head of the CGA(calculated graphic assignment). The quality of the CGA(calculated graphic assignment) and the level of its protection in points are assessed by the manager in accordance with the Regulations on the rating system of assessment. Protected CGA(calculated graphic assignment) is rented to the Department of OP and Emergencies for storage.

3. SOCIO-ECONOMIC SIGNIFICANCE OF OCCUPATIONAL SAFETY

The economic significance of labor protection is determined by the effectiveness of measures to improve conditions and increase labor safety and is an economic expression of the social significance of labor protection. That is, the economic significance of labor protection is assessed according to the results obtained by changing social indicators through the introduction of measures to improve working conditions: increasing labor productivity; reduction of unproductive time and labor costs; increase in the working time fund; reducing costs associated with staff turnover due to working conditions, etc.

An increase in the working time fund and the efficiency of equipment use is achieved by reducing downtime during a shift as a result of a deterioration in well-being due to working conditions and microtrauma. With a complex impact on a person of several harmful production factors, downtime at the workplace can reach 20 ... 40% per shift due to industrial injuries and poor health. The growth of unproductive time, and hence labor, is also caused by poor organization of workplaces: without taking into account organometric requirements, it becomes necessary to make extra movements and make additional physical efforts due to an uncomfortable position, poor location of equipment controls and unsuccessful design of workplaces. As a result of the improvement of working conditions,

the psychological climate in the work collective is normalized, the coherence in work increases, and labor productivity grows. The increase in the working time fund is achieved by reducing round-the-clock losses due to industrial injuries and absenteeism. Harmful working conditions have a significant impact not only on the occurrence of occupational diseases, but also on the occurrence and duration of general diseases. Saving material losses can be achieved through the abolition of benefits and compensation for unfavorable working conditions due to non-compliance with the relevant sanitary and hygienic requirements and labor protection rules. Compliance with such requirements allows you to completely or partially cancel such benefits as: reduced working hours and additional leave; increase in the tariff rate and preferential pension; therapeutic and preventive nutrition and free delivery of milk. All these benefits are associated with significant labor losses and are accompanied by the payment of additional funds for the hours actually worked. At enterprises, there is a high turnover of personnel among workers whose work is associated with heavy physical labor, unfavorable sanitary and hygienic conditions, and the monotony of the production process. Of the total number of workers dismissed of their own free will, from 10 to 25% are people who do not like unfavorable working conditions.

European model of economic incentives for labor protection.

Improving working conditions and labor protection, which is in the interests of not only the workers themselves, but also entrepreneurs and society as a whole, in market conditions is closely related to the economic incentives for employers. Stimulation of measures for labor protection is carried out in accordance with Section IV "Promotion of labor protection" of the Law of Ukraine "On labor protection". Yes, Art. 25 "Economic incentives for labor protection" determines that any incentives for active participation and initiative in the implementation of measures to improve safety and improve working conditions can be applied to employees of enterprises. The types of incentives are determined by the collective agreement (agreement, labor contract).

The procedure for preferential taxation of funds allocated for labor protection measures is determined by the current legislation on taxation. Economic incentives are primarily aimed at increasing the activity and interest of enterprises in improving working conditions at workplaces, as well as increasing the economic responsibility of the owners (administration) of enterprises for damage caused by unfavorable working conditions.

Economic incentives are primarily aimed at increasing the activity and interest of enterprises in improving working conditions in the workplace, as well as increasing the economic responsibility of the owners (administration) of enterprises for damage caused by unfavorable working conditions. With this in mind, labor protection requirements should be given an economic interpretation, performance evaluation indicators should be linked with economic levers of influence on violators of norms and rules. It is necessary to create an effective system of incentives and motivation for the organization and implementation of safe labor processes based on economic responsibility.

In practice, economic regulation is understood as the material (financial) interest and responsibility of divisions, services and departments (organizers and production managers) for creating conditions for safe work, on the one hand, and compliance with established norms and rules, work without injury and accidents of direct executors - with another. The only question is how to do it in practice, how specifically to make the economy work for security.

With the adoption of the law "On labor protection" and by-laws, there was a real opportunity to move to new forms of motivation for the organization and safe performance of work, primarily with the help of an economic mechanism based on targeted methods. The economic-target approach at the production level involves:

- conditions and procedure for the mutual submission of economic sanctions (claims, lawsuits) to contractors for compensation for harm caused due to violation of safety rules and officials (for failure to create regulatory conditions for the safe performance of work); - a combination of economic indicators of the activities of departments and officials with the state of labor protection and the fulfillment (non-fulfillment) of target tasks;

- setting wages, taking into account the need to comply with the rules and regulations of safety in the process of production activities;

- establishment of appropriate additional payments for work in harmful and dangerous conditions;

- stimulation (encouragement) of departments and employees for work without injuries, accidents, occupational diseases, for a high level of organization of work in the field of labor protection, as provided for in Art. 29 of the Law.

The experience of developed countries in the field of labor protection indicates that the following measures contribute to the improvement of working conditions:

- tax incentives for funds aimed at improving working conditions; differentiation of insurance premiums depending on the frequency and severity of injuries and occupational diseases;
- introduction of sanctions for the inaction of owners to improve labor protection conditions.

Summarizing the experience of developed countries on economic incentives, the European Foundation for the Improvement of Living and Working Conditions (one of the organizations of the European Union) determines that most of the current systems are based on precedents, that is, on information about accidents leading to compensation. Such an approach is in itself evidence that the impact of economic stimulus is limited. The Fund offers an innovative model containing a range of economic incentives that can positively influence the improvement of the working environment.

The European Foundation's model for improving living and working conditions focuses on identifying future risks as well as existing ones, and identifying mitigation efforts. The main elements of this model are:

- reduction of the insurance premium in the system of compulsory social insurance against industrial accidents, especially due to efforts to reduce risks compared to the levels established by regulatory enactments;
- establishing a full premium depending on the maximum total risk (most insurance systems calculate the premium on average risk) using three elements:
 - a) a basic component covering the administrative costs and overcompensation of victims of accidents sometimes involving the same risk;
 - b) sectoral component associated with different risks in different sectors of the economy;
 - c) the functional component associated with the maximum risk in the workplace;
 - the opportunity for companies to receive bonuses (in the form of a reduction in full-scale contributions) through the adoption of various measures to improve the working environment, such as:

a) a sub-bonus for enterprises that make more effective efforts in this industry compared to their competitors - reduces the functional component associated with risks in the workplace;

b) a sub-bonus for efforts related to solving a common problem for an industry or type of work may reduce a component of the industry or type of production;

c) sub-bonus relating to special problems of the enterprise;

– financing of consultations on injury prevention in small and medium-sized enterprises;

– assistance with investments (for example, when signing a contract for significant capital investments in improving conditions and improving labor safety in the workplace);

- issuance of labels (like product quality marks) for workplaces where a high level of working conditions has been achieved, which can be useful in creating a reliable image of the company in the market.

The main elements of the development of a new system are:

- the size of the incentive, that is, the economic benefit compared to the cost; system effectiveness in terms of the ability to evaluate and demonstrate the improvement of labor protection and system reliability in relation to one enterprise (in the broadest sense of this concept);
- the positive impact of the system on improving health and safety, i.e. reducing the risk of injury or occupational disease;

the amount of compensation in connection with an industrial injury and its limit; the degree of protection of small and medium-sized enterprises from statistical fluctuations in assessing the financial effect of incentive payments;

- system management and cost.

The following basic conditions are offered as days off:

1. An entrepreneur is a legal entity that benefits from economic incentives for measures to improve the working environment. Therefore, it is the object to which incentives are offered. However, the proposed measures involve the use of social resources of the enterprise. This determines the need for cooperation between all interested parties to take measures to prevent industrial damage.

2. Economic incentives are aimed at improving the working environment, which goes beyond the requirements of the legislation that sets standards in this area.

Since the improvement of the working environment beyond the established laws norms are costly, there is a clear need for economic incentives to achieve high standards. Therefore, economic incentives are proposed not as a replacement, but as an addition to the norms of labor protection legislation. However, it can also be used in enterprises where the state of labor protection does not meet the requirements of the law.

It should be remembered that attestation is one of the methods for creating and maintaining an appropriate level of labor protection and is a comprehensive assessment of each workplace for its compliance with the advanced scientific and technical level of production, labor hygiene standards, and psychophysiological parameters of workers. worker.

4. ASSESSMENT OF THE STATE OF HEALTH AND SAFETY

Control, accounting, analysis, reporting, communication, audit, monitoring - a management function designed to find out the actual state and fulfillment of labor protection tasks in the industry (divisions) in comparison with the plan and current regulations, determine the consequences of these deviations, accumulate planned and actual data, periodic compilation of statistical reports in the established form, decision-making on the definition and inclusion of labor protection measures in the work plans of subsequent years.

Control, audit, monitoring contributes to the implementation by officials of work plans, legislation and other regulations on labor protection. It should determine the degree of completeness of the performance of labor protection duties by officials.

The enterprise must, through an audit, verify that the OSHMS (Occupational Safety and Health Management System):

- meets OHSAS requirements;
- implemented and functioning;
- effective in implementing the policy objectives for labor protection.

During the audit, it is necessary to verify the implementation of the conclusions of preliminary audits and the elimination of identified deficiencies. The results of the audit are provided to the management of the enterprise.

The main purpose of certification is to regulate relations between the employer (or an authorized body) and employees in the field of exercising their rights to healthy and safe working conditions, preferential pensions, benefits and compensation for work in hazardous and harmful conditions. Therefore, certification is carried out at enterprises, institutions and organizations (hereinafter referred to as enterprises), regardless of the form of ownership, types of activity, where the technological process, equipment and materials used can cause dangerous and harmful production factors. Workplaces where the technological process, equipment, used raw materials and materials can be potential sources of harmful and hazardous factors are subject to certification.

Based on the results of the certification, an order is issued for the enterprise, and excerpts from the order are attached to the work books of employees. Materials are tested for 50 years.

Assessment of the state of labor protection and the effectiveness of measures to improve it is one of the main tasks of labor protection management. All types of economic activity in one way or another affect the level of labor protection, raising or lowering it.

In turn, the state of labor protection has a direct impact on the performance of the enterprise.

The proper level of labor protection is ensured by:

- bringing the parameters of the production environment to standard values (technical and technological solutions);
- protection of workers from exposure to hazardous and harmful production factors.

The current assessment of the state of labor protection in production shops and areas can be determined by the generalized coefficient of the level of labor protection K_{sp} , which is the arithmetic average of the sum of three coefficients:

$$K_{sp} = \frac{K_d + K_b + K_{prw}}{3},$$

where $K_d = C_d / C$ - coefficient of the level of compliance with labor protection rules (C_d - the number of employees who comply with labor protection rules; C - the total number of employees);

$K_b = n_{vb} / n$ - coefficient of technical safety of equipment (n_{vb} - the number of pieces of equipment that meets the requirements of safety and sanitation; n - the total number of equipment);

$K_{prw} = m_{sr} / m$ - the coefficient of performance of planned work on labor protection (m_{sr} - the number of actually completed planned work on labor protection; m - the total number of planned works for a certain period of time).

According to the Unified State System of Indicators for Accounting for Labor Conditions and Safety, this coefficient is determined by the commission at the end of the analyzed period of time.

When evaluating the effectiveness of labor protection measures, a combination of four groups of indicators is used:

- 1) characteristics of the configuration of the state of working conditions;
- 2) social indicators;
- 3) economic indicators;
- 4) socio-economic characteristics.

Changes in the state of working conditions are assessed at the workplace. The following working environment factors are taken into account:

- change in the number of machines and mechanisms, industrial premises that meet the requirements of labor protection standards and other regulatory documents;
- improvement of sanitary and hygienic indicators;
- reducing the content of harmful substances in the air;
- improvement of microclimate conditions;
- reduction of noise and vibration levels;
- improvement of lighting, etc.;
- improvement of psychophysiological indicators;
- reduction of increased physical activity; - reduction of neuropsychic stress;
- improvement of aesthetic indicators;
- rational organization of workplaces;
- improvement of premises and territories;
- aesthetics of interior design.

Thus, the change in the state of working conditions by factors is estimated by the difference in their absolute value before and after the implementation of measures or the difference in achieved or predicted results, as well as by comparing relative indicators characterizing the degree of compliance of certain factors with maximum allowable concentrations (MPC), maximum allowable levels (SDA) or specified values. Further, a comprehensive assessment of changes in working conditions is carried out taking into account the increase in the number of jobs where working conditions are brought into line with regulatory requirements.

Social indicators characterizing labor activity include:

- physiological, characterizing changes in the functional state of the human body under the influence of production activities;
- psychological, characterizing the features of mental activity and personality of a person in the labor process;
- genetic, characterizing the influence of working conditions on the reproduction of the labor force;
- labor activity, which characterizes the degree of return by the worker of production in the course of his professional activity of physical, intellectual and psychological abilities;
- the level of occupational and general morbidity associated with unfavorable working conditions;
- the number of employees in the workplace that meets the regulatory requirements (both in aggregate and in terms of individual factors), and the reduction in the number of workers in adverse working conditions;
 - staff turnover due to dissatisfaction with working conditions;
- benefits and compensations to reduce (weaken) the results of the impact on working adverse production factors, to maintain and restore the normal functioning of the physiological systems of the body under special loads at work with harmful and difficult working conditions;
 - the degree of job satisfaction;
 - the prestige of the profession.

The economic indicators of the implementation of measures to improve the state of labor protection include:

- benefits and compensations to persons employed in work with harmful and difficult working conditions;
- expenses for the treatment of production-related and occupational diseases, as well as injuries received at work;
- assistance in case of illnesses, work-related or occupational diseases, as well as those injured as a result of accidents at work;
- pensions for the disabled;
- the cost of retraining personnel due to their turnover caused by adverse working conditions;
- Decrease in output due to temporary disability of workers.

Socio-economic indicators are of an economic nature and are expressed by means of saving or preventing the loss of living and materialized labor in the national economy, at enterprises and in the sphere of personal consumption.

5. LIST OF THEORETICAL QUESTIONS

1. Essence, subject, tasks and methods of labor protection audit.
2. The procedure for conducting an audit on industrial safety and labor protection.
3. Forms of audit on industrial safety and labor protection. audit objects.
4. Labor as a sphere of life and a factor of production. Social and labor relations as a system.
5. Legal regulation of the audit on industrial safety and labor protection.
6. External and internal audit on industrial safety and labor protection.
7. Organizational and technical support of jobs in terms of working conditions.
8. International Labor Organization and its impact on the development of social and labor relations.
9. Determination of the social and economic efficiency of measures to improve labor protection conditions for the implementation of an audit of occupational safety of workplaces.
10. Efficiency of audit in the sphere of labor.

6. METHODOLOGY FOR ASSESSING THE TECHNICAL AND ECONOMIC EFFICIENCY OF MEASURES TO INCREASE LABOR PROTECTION AT PRODUCTION

The effectiveness of measures to improve working conditions and labor protection is assessed, first of all, in terms of social efficiency indicators, which provide for the creation of working conditions that meet sanitary standards and the requirements of safety regulations. Improving working conditions and labor protection leads to a decrease in the number of industrial injuries, general and occupational morbidity; reduce the number of employees working in conditions that do not meet sanitary and hygienic standards; reducing the number of disability pensions due to injuries or occupational diseases; decrease in staff turnover due to unsatisfactory working conditions, etc.

Technical and economic efficiency is calculated with the aim of:

- economic justification of the planned measures necessary to select the best options for technological, ergonomic and organizational solutions;
- determination of the actual effectiveness of measures to improve working conditions and labor protection; - evaluation of the results of production management at different levels;
- calculation of the necessary costs to bring working conditions at workplaces in line with regulatory requirements;
- determination of the optimal amount of financial incentives for employees of the company, research, design and design organizations for the development and implementation of labor protection measures.

Assessment of the technical and economic efficiency of labor protection measures is carried out at enterprises of all forms of ownership, including at the workplace, site, in the shop. It can also be determined by industry and the state as a whole.

Indicators of technical and economic efficiency are calculated as the ratio of the values of social or socio-economic results to the costs necessary for their implementation. Such characteristics characterize the number of conventional units of the total size of the technical and economic result per unit of costs.

Indicators of social and technical and economic efficiency are used to determine the actual level of unit costs required to reduce the number of employees in unsatisfactory

conditions, reduce the level of injuries, morbidity, staff turnover at various enterprises and the economy as a whole.

The economic aspects of labor protection should be assessed using methods for assessing the social and economic effectiveness of measures to create working conditions that meet the current regulations on labor protection.

To assess the social effectiveness of measures to improve working conditions and labor protection, the following indicators are used:

1. The reduction in the number of jobs (ΔK) that do not meet the requirements of labor safety regulations is calculated by the formula

$$\Delta K = \frac{K1-K2}{K3} 100, \%$$

where K1, K2 - the number of jobs that do not meet sanitary standards before and after the event;

K3 - the total number of jobs.

2. The reduction in the number of employees (ΔN) working in conditions that do not meet sanitary standards is determined by the formula

$$\Delta N = \frac{N1-N2}{N3} 100, \%$$

where N1, N2 - the number of employees working in conditions that do not meet sanitary standards before and after the implementation of the event, persons;

N3 - the annual average number of employees, persons.

3. The increase in the number of machines, mechanisms (ΔM) and industrial premises (ΔB), brought to the requirements of labor protection standards, is determined by the formulas

$$\Delta M = \frac{M1-M2}{M3} 100, \%$$

$$\Delta B = \frac{B1-B2}{B3} 100, \%$$

where M1, M2 - the number of machines, mechanisms that do not meet regulatory requirements before and after the event, pcs.;

M3 - the total number of machines and mechanisms, pieces;

B1, B2 - the number of industrial premises that do not meet regulatory requirements before and after the implementation of the event, pcs.; increase in the number of machines, mechanisms and industrial premises brought into line with the requirements of regulatory enactments;

B3 - the total number of industrial premises, pcs.

4. The reduction in the injury frequency coefficient (ΔKh) is determined by the formula

$$\Delta Kh = \frac{N1-N2}{N3} 100, \%$$

where N1, N2 - the number of injuries in accordance with and after the event;

N3 - the annual average number of employees, persons.

5. The reduction in the injury severity coefficient (ΔCT) is calculated by the formula

$$\Delta C_T = \frac{D1}{N1} \frac{D2}{N2},$$

where D1, D2 - the number of days of disability due to injuries in accordance with and after the implementation of the event.

6. Reducing the rate of occupational diseases due to unfavorable working conditions:

$$\Delta K_z = \frac{Z1-Z2}{N3} 100, \%$$

where Z1, Z2 - the number of cases of occupational diseases in accordance with and after the event.

7. Change in the coefficient of severity of illness:

$$\Delta K_{si} = \frac{Dsi1}{Nsi1} \frac{Dsi2}{Nsi2},$$

where Dsi1, Dsi2 - the number of days of temporary disability due to illness in accordance with the event and after the event;

Nsi1, Nsi2 - the number of cases according to and after the event.

8. Reducing the number of cases of retirement with a disability due to injury or occupational disease:

$$\Delta Ni = \frac{Ni1 - Ni2}{N3} 100, \%$$

where $Ni_1, 2$ - the number of employees who became disabled before and after the event, persons.

9. Reducing staff turnover due to adverse working conditions:

$$\Delta Nw = \frac{Np1 - Np2}{N3} 100, \%$$

where $NP1, NP2$ - the number of employees who left of their own accord due to unfavorable working conditions in accordance with and after the event of persons.

According to research, a set of measures to improve working conditions can increase productivity by 15-20%. Thus, the normalization of workplace lighting increases productivity by 6-13% and reduces marriage by 25%. Rational organization of the workplace increases productivity by 21%, rational painting of workplaces - by 2-5%. The economic justification of measures to improve working conditions and labor protection is carried out in the following order:

- a set of measures is determined based on the initial data on the necessary change in the state of working conditions on the basis of certain social indicators for the basic and implemented options:
- the costs for the implementation of measures are determined;
- social and socio-economic efficiency is calculated;
- the economic effect is calculated based on the results of the implementation of measures.

7. CONTENT OF CALCULATION AND GRAPHIC TASKS

The economic efficiency of the developed and implemented measures to improve working conditions and fire safety can be calculated according to the following indicators:

1. Conditional release of the number of employees as a result of the implementation of labor protection measures - calculated by the formula

$$CR_N = [(TW_b - TW_p) / (F - TW_p)] \cdot N, \text{ person.},$$

where (TW_b, TW_p) - loss of working time due to injuries and morbidity before and after the implementation of measures (base year) per employee, man-days;

F - annual fund of working hours of one worker (basic), man-days;

N - the average annual estimated number of employees, people.

2. Possible growth in labor productivity with a constant number of employees is calculated by the formula

$$P = 100 \cdot CR_N / (N - CR_N), \%$$

3. Savings of the salary fund are determined by the formula

$$Sf = CR_N \cdot Sa \cdot (1 + P_{si}/100), \text{UAH}$$

where Sa is the average annual salary of one employee, UAH;

Psi - is the percentage of deductions for social insurance.

4. The savings of the social insurance fund for the payment of sick leave certificates are determined by the formula

Savings of funds of the social insurance fund for the payment of sick leaves are determined by the formula

$$S_{ci} = (V_b / T_b) \cdot [(TW_b - TW_p) \cdot I_g \cdot K \cdot N], \text{UAH},$$

where Wb is the amount of expenses for paying sick leave for the base year, UAH;

where Vb - the amount of expenses for the payment of sick leaves for the base year, UAH;

Tb - loss of working time due to injuries, morbidity in the base year, man-days;

Ig - is the growth index of the average annual wages of workers according to the plan;

K - is the share of occupational morbidity in its total value (take 0.5-0.7).

Exercise 1.

Using the data from table 1, calculate the following indicators (calculations are made on the basis of the above formulas):

1. Conditional release of the number of employees as a result of the implementation of labor protection measures.

2. An increase in labor productivity is possible with a constant number of employees.
3. Saving the payroll.
4. Saving the funds of the social insurance fund for the payment of sick leave certificates.

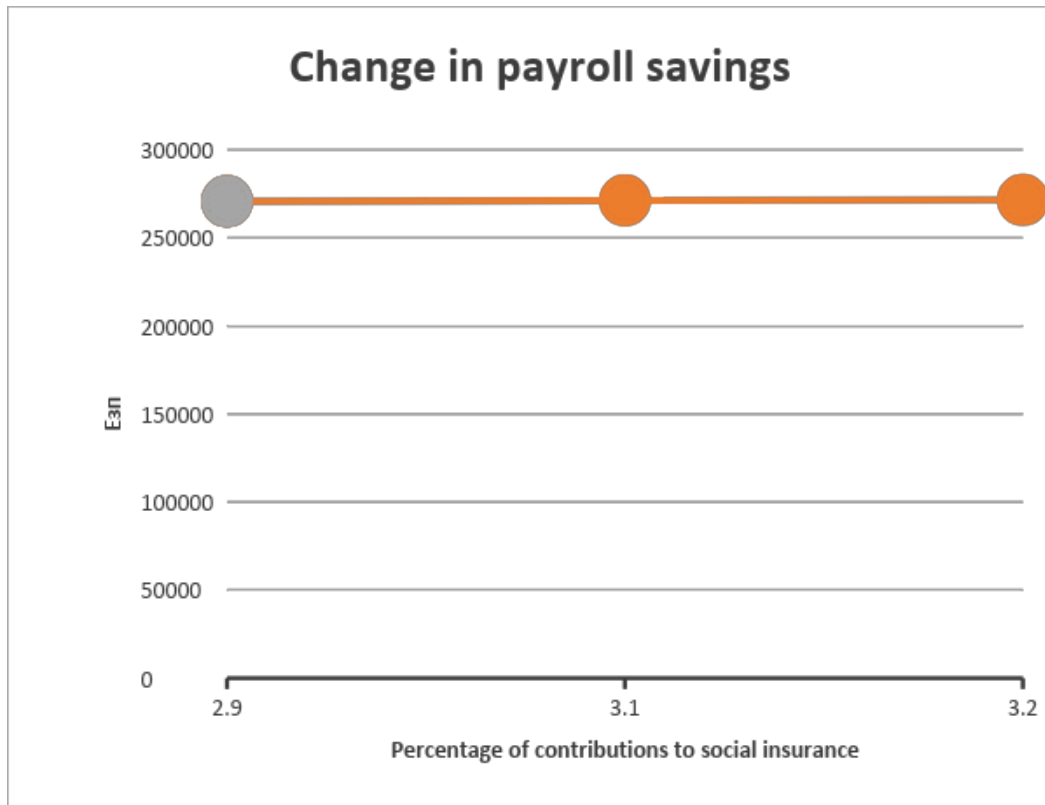
Table 1 - Initial data for the task

Varianty										
Indicators	1	2	3	4	5	6	7	8	9	10
TW_b	40	47	55	67	77	84	90	60	58	75
TW_p	32	36	48	54	63	70	74	46	47	60
F	251	252	250	253	254	255	249	248	256	247
N	51	63	74	85	98	102	123	58	77	89
Sa	30720	32040	33360	31800	36600	32880	34680	35160	33480	37440
P_{si}	2,5	2,7	2,9	2,8	3,0	3,1	4,1	3,8	3,3	3,8
Vb	4895	5975	7339	8421	11095	10831	12534	8506	7585	11368
T_b	40	47	55	67	77	84	90	60	58	75
Ig	1,5	1,6	1,7	1,8	1,9	2,0	2,1	2,2	2,4	2,3

Task 2.

1. How will the Sf change if the P_{si} increases (decreases). Justify the point of view with a calculation and depict it graphically. The range of changes in the PSS: 2.5 - 3.8.

For example, when changing P_{si} in the range of 2.9; 3.1; 3.2 Sf looks like this:



2. Gov vil the Es change if Ts increases (decreases). Justifi the point of vies would be calculation and graphicalli. Range of Changes Fromm: 1.5 - 2, h.

3. How will Sci change if K increases (decreases)? Justify the point of view with a calculation and depict it graphically. Range of changes K: 0.5 - 0.7

What dependence is observed?

4. Compare points 2 and 3 and draw conclusions.

5. Draw conclusions about the completed task in accordance with the list of control questions.

8. CHECKLIST QUESTIONS

1. What is the social significance of labor protection?

2. What social characteristics depend on the state of conservation and working conditions? How do they affect the economic performance of the enterprise?

3. How and by what means can the costs of benefits and compensations for unfavorable working conditions be reduced?

4. Does the turnover of workers affect the economic condition of the enterprise?
5. What expenses does the enterprise make for measures to improve working conditions?
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11. What is the methodology for assessing the social and socio-economic efficiency of measures to improve labor protection?
12. What indicators make up the annual savings of the enterprise, obtained by improving labor protection?
13. In what order are measures for the economic justification of improving working conditions and labor protection determined?
14. What is the simplified methodology for determining the effectiveness of labor protection costs?

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Ministry of Education and Science of Ukraine

National Technical University "Kharkiv Polytechnic Institute"

Department of labor protection and environment

Settlement and graphic task

on the topic:

"Technical and economic efficiency of measures aimed at improving labor protection
in production"

by academic discipline

"Organizational and technical support of the audit on occupational safety of
workplaces in the field of labor protection"

in the specialty "LABOR PROTECTION"

Option

Completed:

student groups

Name

Checked:

Name

Kharkiv 2024

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Educational edition

Methodological instructions for the implementation of the calculation and graphic task “Technical and economic efficiency of measures aimed at improving occupational safety in production”
from the discipline "Organizational and technical ensuring the audit of professional safety of workplaces in the field of labor protection"
for students of specialty 263 "Civil Security"

Compilers: Yevtushenko Nataliia Serhiivna
Tverdokhliebova Natalia Yevheniivna

Responsible for the issue of prof. Vambol S.O.

The work for the publication was recommended by prof.

Ponomarenko O.I.

In the author's edition

Plan 2023, pos. 624

Subp. before printing 2024. Format 60x84 1/12. Offset paper.

Printing - risography. Times New Roman headset. Mind. printing.
arch. 1. Circulation 50 copies. Deputy №. The price is negotiable.

NTU Publishing Center "KhPI".

Certificate of state registration of DK № 5478 dated 21.08.2017
61002, Kharkiv, street Kirpichova, 2

Printing house