Dynamic change in the assessment of labor protection conditions at technological enterprises

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Abstract. Labor protection is a system of ensuring the safety of life and health of workers in the process of work, including legal, socio-economic, sanitary and hygienic, psychophysical, treatment and prophylactic, rehabilitation and other measures. The functions of labor protection are the study of sanitation and occupational hygiene, the implementation of measures to reduce the influence of harmful factors on the body of workers in the process of work. The main method of labor protection is the use of safety measures. At the same time, two main tasks are solved: the creation of machines and tools, when working with which the danger to humans is excluded, and the development of special protective equipment that ensures human safety in the labor process, as well as training workers in safe working practices and the use of protective equipment, conditions are created for safe work.

The main goal of improving working conditions is to achieve a social effect, i.e. ensuring labor safety, preserving the life and health of workers, reducing the number of accidents and diseases at work.

Improving working conditions also yields economic results: an increase in profits (due to an increase in labor productivity); reduction of costs associated with compensation for work with harmful and difficult working conditions; reduction of losses associated with injuries, occupational morbidity; decrease in staff turnover, etc. The main document in the normative and technical documentation is the normative act "Occupational safety standards system".

1. Introduction

In modern conditions of the organization of production, the labor protection management system (OSHMS) is a set of management bodies and control objects interacting with each other (Fig. 4.1).

Occupational safety management - preparation, adoption and implementation of decisions on the implementation of organizational, technical, sanitary-hygienic, treatment-and-prophylactic and other measures to ensure safety, preserve the health and working capacity of a person in the labor process.

The legal framework for the management, supervision and control of safety and labor protection is formed by a system of legislative and regulatory legal acts.

1.1 Obligations of officials in the field of labor protection

The manager, chief engineer, chief mechanic, chief power engineer, other chief specialists, heads of structural divisions, foremen - everyone is obliged to provide safe and harmless working conditions in his area of work.

The chief engineer supervises the development and implementation of labor protection work plans, organizes the execution of instructions from higher authorities, checks the state of safety and sanitary
and hygienic working conditions in workshops and structural divisions, takes prompt measures to eliminate identified deficiencies. His duties also include organizing the development and approval of labor protection instructions for all occupations of workers and work performed, promoting labor protection and providing employees with instructions and rules on labor protection. The chief engineer organizes knowledge testing and advanced training of managers and specialists on labor protection issues, ensures the timely submission of the established labor protection reports, as well as operational information about accidents and the work carried out to eliminate them.

The chief technologist of the enterprise ensures the development and implementation of rational and safe technological processes, devices, tools, as well as adherence to technological instructions.

The chief designer ensures the development of safe structures for machine tools, machines, equipment, fixtures, installations and other products manufactured by the enterprise.

The chief mechanic and the chief power engineer of the enterprise ensure timely maintenance and repairs of equipment, hoisting machines and mechanisms, steam and hot water boilers, apparatus and devices operating under pressure, compressor installations, electrical installations and devices, and also ventilation and heating systems.

The building maintenance service and its personnel carry out technical supervision over the safe condition of industrial buildings and structures.

Safe condition and operation of railway and water transport vehicles, access roads and berths; organization of loading and unloading operations; Proper maintenance of the territory and sanitary facilities and devices of the enterprise, provision of drinking water, means of individual and collective protection is provided by the corresponding deputy heads of the enterprise and the services under their subordination.

![Figure 1](image-url)

**Figure 1.** The number of people in the Russian Federation working in hazardous production

The foreman organizes and creates safe working conditions at workplaces, monitors the condition and proper operation of equipment, fixtures, fences, alarm and automation equipment. He monitors the operation of ventilation units, lighting of workplaces; safe use of electrical equipment, gas welding equipment; carries out labor protection measures (Fig.1)

Together with the public labor safety inspector, the foreman carries out operational control over the state of labor protection. The foreman conducts instruction on labor protection at the workplace, takes part in the training of workers on labor protection, keeps logs of registration of instructions at the workplace.
The foreman immediately reports to the head of the shop about the accidents that have occurred, provides the site with means of visual agitation and promotion of labor protection (instructions, memos, posters).

2. Methods
The labor protection service at an enterprise is an independent structural unit that reports directly to the head or chief engineer of the enterprise and is responsible for organizing work at the enterprise to create healthy and safe working conditions for workers, to prevent accidents at work and occupational diseases.

The labor protection service, labor protection engineer or persons performing his functions are obliged to:

- organize work on labor protection and monitor compliance with the current legislation on labor and labor protection, labor protection structures, industrial sanitation, fire safety at the enterprise;
- monitor compliance with the correct operation of steam boilers, pressure vessels, cylinders with compressed, liquefied and dissolved gases, control equipment, cranes, lifts, schedules for measuring industrial noise, air, vibration;
- draw up a list of high-risk works, register their performance, monitor their safe production;
- develop training programs for workers in safe working methods;
- develop, with the participation of the heads of technical services, a list of instructions on labor protection for certain professions and certain types of work;
- participate in the work of qualification commissions for conducting qualification exams, in commissions for checking the knowledge of working rules, norms and instructions on labor protection;
- participate in the work of examination commissions to test knowledge by officials and specialists of labor legislation, rules and regulations on labor protection;
- develop a program of introductory briefing and ensure its implementation;
- control the provision of workers with individual protective equipment and the correctness of their use;
- participate in drawing up a section of the collective agreement concerning the improvement of working conditions, strengthening the health of workers;
- participate in the investigation of accidents and occupational diseases at work, the development of measures to prevent them, keep records and analyze the causes of accidents;
- monitor compliance with the instructions of the state specialized supervision authorities;
- advise employees on labor protection issues, supervise the work of the labor protection cabinet, organize labor protection propaganda at the enterprise, etc.

The employer is obliged to provide training, instruction, advanced training and testing of workers' knowledge of labor protection.

Curricula and programs for the training of workers in professions should provide for theoretical training on labor protection issues and industrial training in safe methods and techniques of labor.

Theoretical training is carried out within the framework of the special academic subject "Labor protection" and (or) the corresponding sections of special disciplines in the amount of at least 10 hours.

When teaching the professions of workers employed in jobs with increased danger, the subject "Labor protection" is taught in the amount of at least 60 hours in institutions providing vocational and technical education, and at least 20 hours - in courses directly in organizations.

Occupational safety training is carried out according to training programs drawn up on the basis of standard programs. When preparing for professions, for which additional (increased) labor safety requirements are imposed, the program is coordinated with the relevant state supervision authorities.

Training, retraining, obtaining a second profession, advanced training in the profession of workers ends with an exam in the qualification commission (Fig.2).
The composition of the commission is determined by the Regulations on the procedure for attestation of persons trained in the professions of workers in conditions of continuous vocational training, and the assignment of qualifications to them. The exam tickets include questions on labor protection. The results of testing knowledge on labor protection issues are drawn up in a protocol, which is stored for 5 years, and recorded in a personal card.

Responsibility for the organization of timely and high-quality training and testing of knowledge as a whole for the enterprise is assigned to the employer (chief engineer, technical director), in subdivisions (workshop, site, workshop, laboratory) - to the head of the department, and in the educational institution - to the director ... The timeliness of training in labor safety methods for employees of an enterprise and an educational institution is controlled by the labor protection department or an employee who is entrusted with these duties by order of the head of the enterprise (educational institution).

The study of the basics and training in occupational health and safety issues is carried out at all stages of education: in higher and secondary specialized educational institutions, in the system of vocational schools in order to form a conscious and responsible attitude towards personal safety and safety among young people others.

Particular attention is paid to specialties associated with working in hazardous and unfavorable working conditions, for example, construction work, maintenance of electrical installations, etc.

Students of secondary specialized educational institutions study the course "Labor protection" or an independent section on labor safety when passing special disciplines.

Students 'and trainees' diploma projects and coursework include occupational safety issues. The form of knowledge control at the end of the occupational safety course is an exam.

An introductory briefing on labor protection is carried out upon admission to a permanent or temporary job by the labor protection service of the enterprise. All new entrants to the enterprise, as well as business travelers, students who have come to practice, graduate students, interns must undergo this instruction.

The purpose of this briefing is to familiarize with the general rules and requirements of labor protection at the enterprise.

The introductory briefing is carried out by an occupational safety engineer or a specialist of the organization who is entrusted with these duties.

The introductory briefing is carried out according to the program (instructions) approved by the head of the organization, containing the following questions:

- general information about the organization and characteristic features of production;
- rules of conduct for employees on the territory of the organization;
- other specific questions of labor protection.

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**Figure 2.** The number of accidents at work (thousand people)

The number of accidents at work decreased from 70 thousand in 2007 to 20 thousand in 2017.
• the main provisions of contracts: labor and collective;
• rules of internal labor regulations of the organization, responsibility for violation of these rules;
• organization of work on the management of labor protection;
• control and supervision over compliance with labor protection requirements in the organization;
• the main hazardous and harmful production factors, typical for the given production;
• PPE, the procedure and standards for issuing them and the timing of wearing;
• procedure for investigation and registration of accidents and occupational diseases;
• action of employees in case of an accident at work, provision of first aid to victims;
• fire safety, personnel actions in the event of a fire and other issues.

Carrying out the initial briefing and internship is confirmed by the signatures of the persons who conducted and passed the instructing (internship), in the register of instruction on labor protection or in the personal training card, if it is used.

Initial instruction at the workplace is carried out for all those accepted to the enterprise before the first admission to work (including business travelers, students who arrived for practice, graduate students, interns), as well as when transferring from one department to another.

Initial instruction at the workplace is carried out with each employee individually with a practical demonstration of safe practices and methods of work. It is allowed to conduct such a briefing with a group of workers serving the same type of equipment within a common workplace.

The purpose of such instruction is to study specific requirements and safety rules for specific equipment when performing a specific technological process.

All workers, after the initial instruction at the workplace, must undergo an internship within 2-14 shifts under the guidance of a person appointed by order (order) for the shop (site, etc.). Workers are allowed to work independently after an internship, verification of knowledge and acquired skills in safe ways of working.

Initial instruction at the workplace is carried out according to the program approved by the head of the organization.

Re-instruction is carried out at least once a half-year, and for high-risk work - once a quarter according to the program of primary instruction at the workplace or according to instructions on labor protection for professions and types of work.

The purpose of this briefing is to restore labor protection rules in the employee's memory, as well as to analyze the violations of safety requirements in the practice of the enterprise.

Unscheduled instruction is carried out when:
• adoption of new regulatory legal, technical acts, standards, rules, instructions, as well as changes and additions to them;
• changes in technological processes, replacement or modernization of equipment and other factors affecting labor protection;
• during interruptions in work for 60 calendar days, and for works subject to additional (increased) safety requirements, more than 30 days;
• in case of violation by employees of normative, technical legal acts on labor protection, which led or could lead to an accident, industrial accident and other serious consequences;
• during breaks in the profession (in office) - more than 6 months;
• upon receipt of information materials on accidents and accidents that have occurred in one-profile organizations;
  - at the request of the supervisory authorities.

Unscheduled instruction is carried out individually or with a group of people working in the same profession (position). Target instruction is carried out when:
• performing one-time work not related to direct duties in the specialty (loading and unloading, cleaning the territory, etc.);
• elimination of the consequences of accidents, natural disasters and catastrophes;
• the production of work for which a permit is issued; conducting excursions in the organization; organization of mass events with students (excursions, hikes, sports competitions, etc.).
The briefing ends with a test of knowledge by oral questioning or with the help of technical training aids.

Registration of target instruction in a separate journal is allowed.

Registration of briefings. Primary, repeated, unscheduled and targeted briefings are carried out by the immediate supervisors of the work (foreman, industrial training instructor, teacher). Conducting primary, repeated, unscheduled, targeted briefings and internships is confirmed by the signatures of the persons who conducted and completed the instruction (internship), in the register of instruction on labor protection or in the personal training card (if applicable).

Targeted briefing with workers carrying out work on a permit, permit, etc. (provided for certain types of high-risk work), is recorded in a mandatory order in a work permit, permit or other document authorizing work.

When registering an unscheduled briefing, the reason for its conduct is indicated in the briefing log.

The logs of registration of introductory briefings and the log of registration of instructions on labor protection should be numbered, laced and sealed. The register of the introductory briefing is certified by the signature of the head of the organization or a person authorized by him.

The storage period of the named journals is 10 years from the time of the last entry.

3. Results

Permission to work with increased danger

To work with increased danger, employees are allowed who have undergone special training in labor protection according to programs that take into account the specifics of the work performed, and who have received the appropriate document after testing their knowledge. Increased requirements are imposed on the state of health of such workers. Persons who do not have appropriate knowledge of labor protection are not allowed to work with increased danger.

For the performance of work of increased danger at enterprises, a work permit system must be introduced.

Work permit - a written permit for the production of work, which indicates the nature, place, time of the beginning and end of work, the conditions for its safe conduct, the composition of the workers and those responsible for the safety of the work specified in the work permit.

4. Discussion

An approximate list of works with increased danger, for the performance of which preliminary training and testing of workers' knowledge of labor protection are required, is given in the annex to the Rules. Such work includes work at height, inside tanks, work with hazardous chemical materials, in electrical installations and many others.

The work permit is issued before the start of work with an increased danger. The work permit can be issued by the chiefs, mechanics and power engineers of the workshops where the above works will be performed. The person who issued the permit is the responsible manager of the work of increased danger.

Closing the work permit after the end of the work is formalized with the signatures of the responsible manager and the executor. The closed work permit is returned to the person who issued it and is stored for a year.

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