



## Development of tools for managing professional risk at enterprises and reducing the possibility of threats to employees' health

## Desarrollo de herramientas para gestionar los riesgos profesionales en las empresas y reducir la posibilidad de amenazas a la salud de los empleados

Boris Sevastyanov<sup>1,\*</sup>, Robert Shadrin<sup>1</sup>, Irina Dolinina<sup>2</sup>

<sup>1</sup> FSBEI of HE "Kalashnikov Izhevsk State Technical University". Izhevsk, Russia.

<sup>2</sup> Perm National Research Polytech University. Perm, Russia.

\*Corresponding author E-mail: [sbv47@mail.ru](mailto:sbv47@mail.ru)

(*recibido/received: 02-diciembre-2021; aceptado/accepted: 15-febrero-2022*)

### ABSTRACT

When checking organizations by executive authorities, special attention is paid to the availability of documents related to the assessment of professional risks. One such document is the register of identified hazards for each profession. The work considers the development of a standard register using the example of a milk pasteurization and cooling apparatus operator. The choice of a profession is based on an assessment of accidents that have occurred at the enterprise - most of it relates to this profession, and a varied list of hazards arising in the course of the technological process and the performance of work duties. The developed register contains identified hazards, grouped into categories according to the primary source of hazard: mechanical, thermal, electrical, associated with microclimate, chemical and biological nature, associated with aerosols of fibrogenic action, noise, vibration, lighting of the working area, the severity and intensity of labor, process, transport, fire and explosion. The model register is part of the regulation on the OSH management system at the enterprise. It can be used in the same way as the standard OSH instructions. The list of identified hazards applies to most of the occupations in the workshop. Typical registries will reduce the time spent on their development in the organization.

**Keywords:** Hazard identification; Occupational risk; Register of identified hazards; Milk pasteurization and cooling machine; Labor protection instructions.

### RESUMEN

En el control de las organizaciones por parte de las autoridades ejecutivas, se presta especial atención a la disponibilidad de documentos relacionados con la evaluación de los riesgos profesionales. Uno de estos documentos es el registro de riesgos identificados para cada profesión. El trabajo contempla la elaboración de un registro estándar utilizando el ejemplo de un operador de aparatos de pasteurización y refrigeración de leche. La elección de una profesión se basa en la evaluación de los accidentes ocurridos en la empresa - la mayoría de ellos relacionados con esta profesión- y en una variada lista de peligros que surgen en el transcurso del proceso tecnológico y el desempeño de las funciones laborales. El registro elaborado contiene los peligros identificados, agrupados en categorías según la fuente primaria de peligro: mecánicos, térmicos, eléctricos, asociados al microclima, de naturaleza química y biológica, asociados a los aerosoles de acción fibrogénica, al ruido, a las vibraciones, a la iluminación de la zona de trabajo, a la

gravedad e intensidad del trabajo, al proceso, al transporte, al fuego y a la explosión. El modelo de registro forma parte de la normativa sobre el sistema de gestión de la SST en la empresa. Puede utilizarse del mismo modo que las instrucciones estándar de SST. La lista de peligros identificados se aplica a la mayoría de las ocupaciones del taller. Los registros tipo reducirán el tiempo dedicado a su elaboración en la organización.

**Palabras claves:** Identificación de peligros; Riesgo laboral; Registro de peligros identificados; Máquina de pasteurización y refrigeración de leche; Instrucciones de protección laboral.

## 1. INTRODUCTION

According to the Article 209 of the Labor Code of the Russian Federation (The Labor Code of the Russian Federation No. 197-FZ, 2001), occupational risk management is a complex of interrelated activities that are elements of the OSH management system and include measures to identify, assess and reduce the levels of occupational risks.

Occupational risk – the probability of infliction of harm to health as a result of exposure to harmful and (or) hazardous workplace factors while fulfilling work commitments by the employee or in other cases established by the Labor Code of the Russian Federation No. 197-FZ (2001), other federal laws.

Professional risk management is understood as an ongoing process of successively implemented stages. First of all, this is the identification of risk factors, the assessment of the parameters of working conditions, the formation of tasks and the actual risk management.

The concept of risk management focuses labor safety as a system of measures and means not at hazardous events, but at hazardous situations, preventing them, as far as it is reasonable and feasible, from actualizing into hazardous events. The transition to an assessment of the potential hazard of production by risk indicators and the development of optimal preventive measures on this basis is the main task of labor safety management.

In 2019, there was a change in the procedure of checking the OSH management system at the enterprise (Order of the Ministry of Labor and Social Protection of the Russian Federation No. 77, 2019). Federal Labor and Employment Service (Rostrud) issued new instructions to inspectors of the state labor inspectorate for carrying out unscheduled inspections and investigating accidents:

- check documents in a real environment at workplaces;
- control the management of professional risks;
- identify the underlying causes of accidents and indicate them in the formal note in a special form.

A new inspection regulation was adopted (Order of the Ministry of Labor and Social Protection of the Russian Federation No. 160, 2019). The changes concern not only labor safety issues, but also compliance with labor legislation in general. A clear definition of the notion “threat of infliction of harm to health and life” is given. The regulation contains a list of situations that the state inspection interprets as a threat. Among them:

- violation of work and rest schedule;
- permit to work employees who have not undergone training, instructions, practice at the workplace, medical examinations, psychiatric examinations;

- lack of an OSH management system or its improper functioning;
- no special assessment of working conditions;
- failure to provide employees with personal and collective protective equipment.

Clause 10.2 of Order of the Ministry of Labor and Social Protection of the Russian Federation No. 77 (2019) contains a list of the organization's local regulations that are subject to verification in the field of professional risk management:

- list (register) of hazards;
- a document (employer's OSHMS regulations section) describing the method(s) used to assess the level of risk;
- a document confirming the assessment of risk levels, indicating the established levels for each risk;
- a document containing a list of measures to eliminate, reduce or control risk levels.

Taking into account the changes that have taken place in the regulatory framework of the Russian Federation, organizations and labor protection specialists should pay great attention to the occupational risk management system and, in particular, hazard identification and professional risk assessment.

## **2. RESEARCH METHODS**

The first step in occupational risk management is hazard identification. The hazard identification procedure is contained in GOST 12.0.230.4-2018 (2018). Hazard identification is the procedure for detecting (identifying and recognizing) and describing hazards. The purpose of identification is to identify all hazards arising from the technological process, hazardous substances, works performed, equipment and tools involved in the technological process.

When identifying hazards, it is necessary to consider:

1. technological processes and their parameters;
2. hazardous substances;
3. equipment and tools;
4. standard works (work performed on regular basis):
  - starting and stopping installation of equipment;
  - maintenance, technical diagnostics, repair;
5. non-standard works, including but not limited to the following:
  - trips away from the workplace (business trips, movement between departments);

- construction;
  - commissioning works;
  - weather;
  - incidents;
  - emergencies;
6. activities of all personnel with access to the workplace, including contractors and visitors;
  7. hazards arising outside the workplace that can negatively affect the health and safety of persons working under organization's control at the workplace;
  8. hazards arising in the vicinity of the workplace, as a result of activities under the control of the organization, for example, accidents at hazardous production facilities;
  9. infrastructure, equipment and materials in the workplace provided by the organization or others.

The following references should be used as the main sources of information for identifying hazards:

- technical documentation for equipment and technological documentation for processes;
- information on substances and energies involved in the technological process;
- safety rules, standardized documents on labor safety and other regulatory and legal documents related to the process under consideration;
- information about accidents, incidents and occupational diseases in the organization and the results of their investigation;
- results of hazard identification at hazardous production facilities of the enterprise;
- information about accidents (emergencies) that took place outside the production sites of the enterprise, which could affect the working conditions at the workplace;
- labor safety instructions;
- results of a special assessment of working conditions;
- complaints from employees related to inadequate working conditions, as well as suggestions for improving working conditions;
- information about incidents that took place during business trips;
- results of administrative and production control in the field of labor and industrial safety;
- declarations of industrial safety;

- instructions of supervisory authorities in the field of labor and industrial safety.

For the identified hazards, existing control measures are defined, such as:

- collective protective equipment – fencing of cars, blocking, signaling, warning lights, siren;
- administrative control measures – safety signs, warnings, hazardous area markings, walkway markings, safety procedures, equipment checks, access control, work safety systems, work permits, work safety briefings, etc.;
- organizational measures: replacement of equipment, machines and mechanisms, modernization of existing equipment, machines and mechanisms, etc.;
- personal protective equipment.

After identifying the hazards at the workplaces in question, an appropriate register is drawn up. When developing a register of identified hazards, the following references are used:

- An indicative list of possible hazards contained in paragraph 35 of the “Model Regulation on the Occupational Safety and Health Management System”;
- Contents of checklists related to the professions of dairy production is in the Order of the Federal Labor and Employment Service No. 655 (2019). In addition to possible hazards, the register contains the probable consequences of the actualization of hazards and some measures to manage professional risks.

### 3. RESULTS

Using the method described above, a model register of identified hazards for the operator of milk pasteurization and cooling was developed, presented in Table 1.

Table 1. Model register for the profession “Operator of milk pasteurization and cooling”.

No.	Name of hazards	Actualization of hazards	Measures
<b>1</b>		<b>Mechanical hazards</b>	
1.1	Hazard of falling due to loss of balance, including tripping or slipping, when moving on slippery surfaces or wet floors	Contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; installation of warning signs.
1.2	Hazard of falling from a height, including due to the lack of a guard rails	Contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; installation of warning signs; marking of hazardous areas; checking the condition of the safety fences.
1.3	Hazard of falling due to the sudden leading edge	Contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; installation of warning signs.
1.4	Hazard of stroke	Contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; installation of warning signs;

1.5	Hazard of being drawn into moving parts of machines and mechanisms	Capture of hands, special clothing, contusions, injuries of varying severity, death	markings of hazardous areas. Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; installation of warning signs; markings of hazardous areas.
1.6	Hazard of winding hair, clothing parts, personal protective equipment	Capture of hands, special clothing, contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use.
1.7	Hazard of exposure to pressurized fluids due to leakage (breakthrough)	Heat burns, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision and usage of PPE; equipment inspection.
1.8	Hazard of crushing, including due to collision of a vehicle, due to falling under moving parts of mechanisms, due to falling	Capture of hands, special clothing, contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; installation of warning signs; markings of pedestrian zones; instructing and testing the knowledge of drivers.
1.9	Hazard of cutting, cutting from exposure to sharp edges in case of contact with unprotected areas of the body	Injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use;
1.10	Hazard of cutting body parts, including with the edge of a sheet of paper, a utility knife, scissors, sharp edges	Lacerations, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, markings of hazardous areas.
1.11	Hazard from cutting tools	Lacerations, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision and usage of PPE.
1.12	Hazard of injury from snow and (or) ice falling from the roofs of buildings and constructions	Injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; installation of warning signs; markings of hazardous areas.
<b>2</b>	<b>Electrical hazards</b>		
2.1	Hazard of electric shock due to contact with conductive parts that are charged with electricity due to faulty condition (indirect contact)	Electric trauma, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; equipment inspection.
<b>3</b>	<b>Thermal hazards</b>		
3.1	Hazard of burns due to contact of unprotected parts of the body with the surface of objects with a high temperature	Heat burns, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; markings of hazardous areas, installation of warning signs, equipment inspection, installation of protective shields.
3.2	Hazard of burns from exposure of unprotected areas of the body to materials, liquids or gases with a high temperature	Heat burns, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; markings of hazardous areas, installation of warning signs, equipment inspection.

3.3	Hazard of heat stroke from surrounding equipment's surfaces with a high temperature	Contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use; markings of hazardous areas, installation of warning signs, equipment inspection, installation of protective shields.
3.4	Hazard of heat stroke due to long term presence in the room with a high air temperature	Contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, equipment inspection, control over microclimate parameters; balanced work and rest schedule.
3.5	Hazard of burns from exposure of unprotected areas of the body to materials, liquids or gases with a low temperature	Heat burns, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use.
<b>4</b>	<b>Hazards of exposure to microclimate</b>		
4.1	Hazard of exposure to low air temperatures	Heat burns, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, control over microclimate parameters; scheduled breaks.
4.2	Hazard of exposure to high air temperatures	Heat burns, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, control over microclimate parameters; scheduled breaks.
4.3	Hazard of exposure to humidity	Contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, control over microclimate parameters; scheduled breaks.
<b>5</b>	<b>Hazards of exposure to chemical agents</b>		
5.1	Hazard from contact with highly hazardous substances;	Chemical and heat burns, intoxication, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use.
5.2	Hazard from inhalation of vapors of harmful liquids, gases, dust, fog, smoke	Chemical and heat burns, intoxication, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use.
5.3	Hazard of skin exposure to cleaning and degreasing agents	Chemical and heat burns, intoxication, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use.
<b>6</b>	<b>Hazards of exposure to aerosols of predominantly fibrogenic action</b>		
6.1	Hazard of eyes exposure to dust	Diseases	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees.
6.2	Hazard of injury of the respiratory system by dust particles	Diseases of the respiratory system	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees.
6.3	Hazard of skin exposure to dust	Diseases of the skin	Occupational safety briefing; training and

		integuments	periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees.
6.4	Hazard of the respiratory system exposure to the air mixtures containing cleaning and degreasing agents	Chemical burns, diseases of the respiratory system	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees.
<b>7</b>	<b>Hazards of exposure to biological agents</b>		
7.1	Hazard of exposure to microorganism-producers, specimens containing live cells and microbial spores	Diseases	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees.
7.2	Hazard of contact with pathogenic microorganisms	Diseases	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees.
<b>8</b>	<b>Hazards related to severity and tensity of the working process</b>		
8.1	Hazard of manual handling	Contusions, injuries of varying severity	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees, balanced work and rest schedule.
8.2	Hazard of lifting weights exceeding the permissible weight	Diseases of the musculoskeletal system, injuries	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees, balanced work and rest schedule.
8.3	Hazard of body tilt	Contusions, injuries of varying severity, diseases of the musculoskeletal system	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees, balanced work and rest schedule.
8.4	Hazard related to working posture	Diseases of the musculoskeletal system, injuries	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees, balanced work and rest schedule.
8.5	Hazard of harmful for health postures related to excessive body strain	Injuries, diseases of the musculoskeletal system	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees, balanced work and rest schedule.
8.6	Hazard of mental work load, stresses	Diseases of the nervous system	Occupational safety briefing; medical examinations of employees; balanced work and rest schedule.
8.7	Hazard of overstrain of visual analyzer	Diseases	Occupational safety briefing; medical examinations of employees; balanced work and rest schedule.
<b>9</b>	<b>Hazards of exposure to noise</b>		
9.1	Hazard of injury of the ear membrane from exposure to high-intensity noise	Diseases of the ears	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees, balanced work and rest schedule.
9.2	Hazard of possibility of not hearing the sound signal of	Contusions, injuries, heat burns, death	Occupational safety briefing; training and periodic testing of employees' knowledge;



	danger		provision of PPE and control over their use; conducting exercise and inspection of PA fire alarm system.
<b>10</b>		<b>Hazards of exposure to vibration</b>	
10.1	Hazard of exposure to general vibration	Diseases of the central nervous system	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees, balanced work and rest schedule.
<b>11</b>		<b>Hazards of exposure to light environment</b>	
11.1	Hazard of insufficient light in the working area	Contusions, injuries of varying severity, diseases	Occupational safety briefing; inspection of workplace illumination.
<b>12</b>		<b>Hazards of exposure to non-ionizing radiation</b>	
12.1	Hazard of exposure to electrostatic field	Diseases	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees.
12.2	Hazard of electromagnetic radiation	Diseases	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees.
12.3	Hazard of exposure to ultraviolet radiation	Diseases	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees, installation of protective shields.
<b>13</b>		<b>Hazards of exposure to insects</b>	
13.1	Hazard of insect bite	Diseases	Occupational safety briefing; training and periodic testing of employees' knowledge; medical examinations of employees, pest control of company's territory.
13.3	Hazard of helminthes invasions	Diseases	Occupational safety briefing; training and periodic testing of employees' knowledge; provision of PPE and control over their use, medical examinations of employees.
<b>14</b>		<b>Hazard of drowning</b>	
14.1	Hazard of drowning in the reservoir	Death	Occupational safety briefing; training and periodic testing of employees' knowledge.
<b>15</b>		<b>Hazards related to institutional weaknesses</b>	
15.1	Hazard related to the lack of instructions in the workplace containing the procedure for the safe performance of work, and information about the existing hazards related to the performance of work operations	Contusions, diseases, injuries of varying severity, death, breakdown and destruction of equipment	Occupational safety briefing; training and periodic testing of employees' knowledge, inspection of workplace.
15.2	Hazard related to the lack of described measures (content of actions) in the event of malfunctions (dangerous situations) during the maintenance of devices, equipment, instruments	Contusions, diseases, injuries of varying severity, death, breakdown and destruction of equipment	Occupational safety briefing; training and periodic testing of employees' knowledge, inspection of workplace.
15.3	Hazard related to the lack of a list of possible accidents at the	Contusions, diseases, injuries of varying	Occupational safety briefing; training and periodic testing of employees' knowledge,

	workplace	severity, death, breakdown and destruction of equipment	inspection of workplace.
15.4	Hazard related to the lack of a first-aid kit at the workplace, instructions for providing first aid to an injured person at production site and communication equipment	Injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge, inspection of the availability and contents of a first aid kit.
15.5	Hazard related to the lack of information (diagrams, signs, markings) about the direction of evacuation in the event of an accident	Contusions, diseases, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge, inspection of the availability of warning signs, markings
15.6	Hazard of admitting workers who have not received training in labor safety	Contusions, diseases, injuries of varying severity, death, breakdown and destruction of equipment	Occupational safety briefing; training and periodic testing of employees' knowledge; control over training and occupational safety briefing processes.
<b>16</b>	<b>Hazards of fire</b>		
16.1	Hazard of inhaling smoke, vapors of harmful gases and dust in case of fire	Diseases, contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; inspection of fire alarm systems and fire extinguishing systems; inspection of extinguishing equipment.
16.2	Hazard of inflaming	Diseases, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; inspection of fire alarm systems and fire extinguishing systems; inspection of extinguishing equipment.
16.3	Hazard of exposure to open fire	Heat burns, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; inspection of fire alarm systems and fire extinguishing systems; inspection of extinguishing equipment.
16.4	Hazard of exposure to high ambient air temperature	Diseases, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; inspection of fire alarm systems and fire extinguishing systems; inspection of extinguishing equipment.
16.5	Hazard of exposure to low oxygen concentration in the air	Diseases, contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; inspection of fire alarm systems and fire extinguishing systems; inspection of extinguishing equipment.
16.6	Hazard of exposure to fire extinguishing agents	Diseases, contusions, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; inspection of fire alarm systems and fire extinguishing systems; inspection of extinguishing equipment.
16.7	Hazard of exposure to fragments of collapsed buildings, constructions	Heat burns, injuries of varying severity, death	Occupational safety briefing; training and periodic testing of employees' knowledge; inspection of fire alarm systems and fire extinguishing systems; inspection of

			extinguishing equipment.
<b>17</b>		<b>Hazards of transport</b>	
17.1	Hazard of falling from a vehicle	Contusions, injuries of varying severity, death	Occupational safety briefing; training and testing of employees' knowledge;
17.2	Hazard of crushing a person between two approaching vehicles	Contusions, injuries of varying severity, death	Occupational safety briefing; training and testing of employees' knowledge;
17.3	Hazard of cargo moving during vehicle movement due to non-observance of the rules for its stowage and fastening	Contusions, injuries of varying severity, death	Occupational safety briefing; training and testing of employees' knowledge;
17.4	Hazard of injury from a motorized vehicle accident	Contusions, injuries of varying severity, death	Occupational safety briefing; training and testing of employees' knowledge; testing the knowledge of vehicle drivers; inspection of technical condition of the vehicle.
<b>18</b>		<b>Hazards of abuse</b>	
18.1	Hazard of abuse from hostile coworkers	Contusions, injuries, diseases, death	Occupational safety briefing; training and testing of employees' knowledge;
<b>19</b>		<b>Hazards of explosion</b>	
19.1	Hazard of spontaneous combustion of combustible substances	Heat burns, injuries of varying severity, death, breakdown of equipment.	Occupational safety briefing; training and periodic testing of employees' knowledge; inspection of fire alarm systems and fire extinguishing systems; inspection of extinguishing equipment, control over the storage and placement of hazardous substances.
19.2	Hazard of explosion due to fire	Heat burns, injuries of varying severity, death, breakdown of equipment.	Occupational safety briefing; training and periodic testing of employees' knowledge; inspection of fire alarm systems and fire extinguishing systems; inspection of extinguishing equipment.
19.3	Hazard of exposure to shock wave	Heat burns, injuries of varying severity, death, breakdown of equipment, buildings.	Occupational safety briefing; training and periodic testing of employees' knowledge.
19.4	Hazard of burns from explosion	Heat burns, injuries of varying severity, death.	Occupational safety briefing; training and periodic testing of employees' knowledge; inspection of fire alarm systems and fire extinguishing systems; inspection of extinguishing equipment.
<b>20</b>		<b>Hazards related to the use of personal protective equipment</b>	
20.1	Hazard of non-compliance of personal protective equipment with human anatomical features	Diseases, contusions, injuries of varying severity	Inspection of PPE
20.1	Hazard of constrained movements caused by the use of personal protective equipment	Diseases, contusions, injuries of varying severity	Inspection of PPE

The developed model registers are part of the regulation on the occupational safety management system at the enterprise. They can be used in the same way as model labor safety instructions. Specialists in the field of labor safety are able to edit the contents of the register on their own in accordance with the characteristics of the workplace and the working conditions of a particular employee.

## **4. DISCUSSION**

The development of standard registers of identified hazards and their implementation at the enterprise has a number of positive aspects for all levels of the organization.

Familiarization of the worker in the working profession with the register of identified hazards is an important part of the process of teaching the rules and regulations for the safe performance of work. The register warns of potential hazards associated with a specific production site. In addition to the job description on labor protection, the register is not only an indicator of hazards, but also a set of recommendations on how to avoid these hazards, thereby preserving professional health.

For specialists in the field of labor protection, a positive aspect of using the registers of identified hazards is saving working time in creating labor protection documentation, as well as improving the quality of introductory, initial, repeated and other briefings by submitting more complex, complete material.

For the management of the enterprise, the benefit of the registers of identified hazards lies in the readiness for inspections of the implementation of labor protection legislation by the executive authorities, namely the state labor inspectorate.

## **5. CONCLUSION**

The use of standard registers of identified hazards is a rational solution in the field of implementation of the requirements of legislation in the field of labor safety. A similar experience takes place with standard OSH instructions for workers in blue-collar occupations, whose job responsibilities often do not fundamentally differ from enterprise to enterprise. Such an attitude towards the registers of identified hazards will allow saving the time of the labor protection specialist in the preparation of the risk assessment procedure.

A deeper practical component of the development and use of standard registers can be described through the concept of unification - the procedure for bringing documentation to a single standard. A logical continuation of the work could be the creation of a database of registers of identified hazards under the control of the executive authorities responsible for the management, supervision and control of labor protection in Russia. The development of registers for certain professions should be entrusted to specialized universities that closely cooperate with enterprises. A similar practice is observed when creating state standards and guidelines.

## **ACKNOWLEDGMENTS**

The work was carried out with the financial support by Kalashnikov Izhevsk State Technical University within the framework of the grant No. ИИПО/20-86-11.

## **REFERENCES**

GOST 12.0.230.4-2018. (2018). "The system of labor safety standards. OSH management systems. Methods for identifying hazards at various stages of work". Federal Agency for Technical Regulation and Metrology. Moscow, Russia: Standartinform.

Order of the Ministry of Labor and Social Protection of the Russian Federation No. 77. (March 21, 2019). "On approval of guidelines for inspection of the creation and maintenance of the OSH management

system”. Bulletin of Labour and Social Legislation of the Russian Federation No. 6. Federal Labour and Employment Service.

Order of the Ministry of Labor and Social Protection of the Russian Federation No. 160. (June 13, 2019). “On approval of the Administrative Regulations for the Federal Labor and Employment Service to implement federal state supervision over compliance with labor legislation and other regulatory legal acts containing employment and labor laws”. Federal Labour and Employment Service. Retrieved from: <http://publication.pravo.gov.ru/Document/View/0001201910110027>

Order of the Federal Labor and Employment Service No. 655. (November 10, 2017). “On approval of checklists (lists of test questions) for the implementation of federal state supervision over compliance with labor legislation and other regulatory legal acts containing employment and labor laws”. Federal Labour and Employment Service. Retrieved from: <http://publication.pravo.gov.ru/Document/View/0001201801240030>

The Labor Code of the Russian Federation No. 197-FZ. (December 30, 2001). State Duma of the Federal Assembly of the Russian Federation. Retrieved from <https://rg.ru/2001/12/31/trud-dok.html>