Occupational safety and health protection in the dairy industry in accordance with the requirements of gost r 54934-2012 / ohsas 18001: 2007

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Abstract. The results of research on the development of the occupational safety and health management system in accordance with the requirements of GOST R 54934-2012/OHSAS 18001:2007 “Occupational safety and health management system. Requirements” and environmental management systems in accordance with the requirements of GOST R ISO 14001-2016 “Environmental management systems. Requirements and guidelines for use” on the example of a dairy industry enterprise. In this paper, we analyzed the company's activities related to the environment and occupational safety and health. The necessary documentation of the environmental management system and the occupational safety and health system has been developed and integrated where possible.

1. Introduction

Competent management of occupational risks provides significant results in the field of occupational safety and health at industrial enterprises. The occupational safety and health management system is a part of the company's overall management system, which functions to ensure the safety of employees’ lives, through the effective organization of labor protection processes and industrial risk management [1-2].

The occupational safety and health management system contributes to the creation of safe and healthy working conditions and provides a basic approach that allows the company to consistently identify and control risks to the health and safety of employees, reduce the likelihood of accidents, comply with legal standards in the field of occupational safety and improve overall performance [3].

The international standards of the OHSAS series, which cover occupational safety and health management, are designed to provide organizations with elements of an effective occupational safety and health management system that can be integrated with other management requirements (in the field of quality, as well as in the field of ecology) in order to assist organizations in achieving goals for occupational health and safety, as well as in achieving economic goals [4-5].

The overall goal of the OHSAS 18001 standard is to support good occupational health and safety practices while maintaining a balance with socio-economic needs [6].

Implementation of the occupational safety management system in accordance with OHSAS 18001 standards will:

- ensure the safety and preservation of the employee's life in the course of their work;
• improve the overall management of the organization;
• ensure compliance with legal requirements in the field of labor protection;
• reduce the importance of production risks and related losses, including those related to fines and accident payments;
• establish regular activities to reduce the impact of harmful and dangerous factors, to prevent injuries and occupational diseases in your company;
• increase the level of loyalty and professionalism of the staff;
• reduce the probability of accidents and the costs associated with the elimination of possible consequences;
• increase Your Company's market value;
• reduce the cost of insurance, as well as expenses caused by the absence (illness) of employees;
• simplify obtaining various permits (for example, licenses);
• improve the Company's reputation in the eyes of customers, partners, shareholders, investors, and other parties.
• An accident can be an unforeseen event, an unexpected combination of circumstances that resulted in bodily injury or death.

An accident can be defined as the result of a chain of events in which a failure occurred that led to undesirable consequences. It has been proven that human intervention can prevent injury or damage to health that such a chain of events would inevitably lead to. However, taking into account human intervention, we can not fail to note the existence of the potential for even more dangerous chains of events than those that can actually lead to injury or damage to human health.

Accidents happen at any enterprises from time to time, which must be registered in the acts.

Measures to eliminate the causes of accidents, mainly, are the passage of the victim (or the entire unit) instructions, internships, training and testing of knowledge on labor protection.

The most acute environmental problem, which has priority social and economic significance, is the pollution of the environment by the food industry. Industry accounts for more than 80% of air pollution emissions from registered stationary sources. Production and consumption waste generation by all industries in 2016-2020 is shown in Figure 1.

**Figure 1.** Production and consumption waste generation across all industries in 2016-2020.

According to Rosstat data shown in figure 1, over the five years from 2016 to 2020, the generation of production and consumption waste in the dairy industry as a whole increased by 1.4 times.
2. Materials and Methods

The main object of research in this work is dairy industry enterprises, their management system, processes, products, documentation, etc. As well as the role of objects are the standards GOST R ISO 14001-2016 (environmental management systems. Requirements and guidelines for use) [7] and GOST R 54934 - 2012/OHSAS 18001:2007 (Occupational safety and health management systems. Requirements).

The following methods were used for a deep and reliable study of research objects:
1. General Scientific methods:
   Studying enterprise documents is a method that allows you to get primary information about the object of research. The company's documentation allowed us to study its internal structure in more detail.
2. Observation – purposeful perception of the phenomena of objective reality, during which knowledge is obtained about the external aspects, properties and relationships of the objects under study. Observation was carried out by a tour of the necessary workshops and departments of the enterprise.
2. Statistical methods of quality control:
   Stratification method – a method that allows you to divide data into subgroups based on a specific feature. The term stratification means stratification. As a result of stratification, data is divided into groups or layers (strata) according to their characteristics. In order to stratify statistical data, it is important to correctly identify the factors that will be used for stratification. Data collection should be conducted in such a way that these factors can be taken into account. This method was used to identify significant hazards and risks in production.

3. Results and Discussion

Development of a management system for occupational safety and health in the dairy industry

Industrial safety and labor protection and the development of a quality management system are today mandatory conditions for the normal functioning of production. It is well known that ever-increasing competition, along with the development of technological progress, also affects working conditions, its organization, and the processes themselves. Existing legislation is of paramount importance, but its provisions are not sufficient to manage these changes well and prevent the emergence of new risks and dangers. Those responsible for occupational health and safety at industrial enterprises should respond promptly to any changes in this area, as well as develop effective methods in the form of a dynamic management strategy. Today, the issues of industrial safety and labor protection can be compared in importance with the tasks of ensuring environmental safety, since the development of the technosphere recently poses a serious threat to all mankind.

Injuries and illnesses of industrial workers do not necessarily accompany work, and low incomes are not an excuse for showing inattention to the health and safety of employees. Today, almost all employers, governments, and employees themselves have recognized the positive impact of the development and implementation of integrated health and safety management systems in industrial enterprises, which leads to a reduction in risks and hazards, while increasing labor productivity.

Therefore, industrial safety and labor protection arouses interest in its effectiveness. Many organizations try to use all the possibilities of high-quality management of occupational health and safety of personnel.

The development includes 5 stages:
1. Creation of a working group for the development of the occupational safety and health management system.
2. Training of the company's employees to meet the requirements of the standard.
3. Formation of a plan for the development of documentation for the occupational safety and health management system.
4. The analysis of possibilities of integration with the environmental management system.
5. The development of a document management system OHSAS 18001.
3.1. Creation of a working group for the development of the occupational safety and health Management system

After the top management of the enterprise has made a decision to develop a management system for occupational safety and health, a working group is created. The size of the group is selected depending on the type of activity and the size of the enterprise.

Specialists of the working group are trained and consultants of the consulting organization are invited. The enterprise of the dairy industry in the working group included: Deputy Director, a specialist in labour protection and the chief industries.

The working group conducts a preliminary analysis of the organization's labor protection activities, during which it determines:

- laws, rules, standards, programs for labor protection and other requirements that apply to the organization's activities;
- hazards and assess risks arising from the existing or anticipated production environment and work organization;
- planned or existing occupational safety protection measures to eliminate, prevent and reduce risks;
- appropriate measures for occupational health and safety management.

3.2. Development of the "Hazard identification and risk assessment" procedure in accordance with GOST R 54934-2012/OHSAS 18001:2007 "occupational safety and health management systems. Requirements" danger is an object, situation, or action that can cause harm to a person in the form of injury or deterioration of health, or a combination of both.

At a dairy enterprise, the identified hazards are characterized by:

- the probability of occurrence of a hazard;
- the severity of the consequences of the hazard;
- relative frequency of hazard detection.

When developing the procedure, the forecast of the situation is put at the head, in order to determine the dangers before it leads to an accident and further counting of victims and losses.

The procedure "Hazard identification and risk assessment" was developed taking into account the requirements of clause 4.3.1 of GOST R 54934-2012/OHSAS 18001:2007 "occupational safety and health assessment system. Requirements" and GOST R 1.5-2012 "Standardization in the Russian Federation. National standards. Rules of construction, presentation, design and notation” [8].

The procedure determines the procedure for identifying, classifying and quantifying hazards and risks in the structural divisions of the dairy industry, the choice of effective measures to manage the identified hazards and risks, as well as the process of documenting and updating the information received. To implement measures to reduce the causes that determine the potential or maximum danger, responsible persons are appointed and the residual risk is assessed. It was developed in accordance with all the features of the dairy industry and applies to all employees of the organization. The "register of hazards and management risks" and "Register of significant hazards and unacceptable risks" have also been developed.

3.3. Integration of the environmental management system and the OHSAS system

3.3.1 Development of an integrated policy in the field of ecology and occupational safety and health in the dairy industry

According to point 4.2 of the OHSAS 18001:2007 standard "Occupational safety and health management systems. Requirements" occupational safety (OS) and health (OS) policy – the General
intentions and direction of the organization in relation to its performance indicators in the field of OS and OS, officially formulated by the top management.

Top management has developed and implemented the organization's BT and OS policy and has ensured that, within the established scope of its management system, this policy is implemented:

- corresponds to the nature and scale of the organization's risks in the field of BT and OZ;
- includes a commitment to prevent injuries and deterioration of health, as well as to continuously improve the management of BT and OZ and performance indicators in the field of BT and OZ;
- includes obligations, at a minimum, to comply with applicable legal requirements and other requirements in the field of BT and OZ, which the organization has committed to meet and which relate to its hazards in the field of BT and OZ;
- provides a basis for setting and analyzing goals in the field of BT and OZ;
- documented, implemented, and maintained up-to-date;
- brought to the attention of all persons who work under the management of the organization, in order to notify them of their personal responsibilities in the field of BT and OZ;
- available to interested parties;
- periodically reviewed to ensure that it remains relevant and appropriate for the organization.

The environmental policy is a document that reflects the official statement of the organization's top management about the main intentions and activities in relation to environmental performance [9].

According to the requirements of GOST R ISO 14001-2016, top management must develop, implement and maintain up-to-date environmental policies that are within the established scope of the environmental management system:

- corresponds to the organization's goals and environment, including the nature, scope, and environmental impacts of its activities, products, and services;
- provides a framework for setting environmental goals;
- includes the obligation to protect the environment, including the prevention of pollution and other separate obligations related to the organization's environment;
- includes an obligation to fulfill its assumed obligations;
- includes a commitment to continuously improve the environmental management system to improve environmental performance.

Environmental policy ensures the implementation and improvement of the environmental management system, allowing the organization to maintain and improve environmental performance. Therefore, the policy should reflect the commitment of senior management to comply with applicable environmental legislation and other requirements, as well as to follow the principles of pollution prevention and continuous improvement. The environmental policy should be sufficiently clear to be understood by both staff and external stakeholders. The scope of the policy should be precisely identifiable and reflect the unique nature, scope, and environmental impacts of activities, products, or services within the established scope of the environmental management system [10-13].

Environmental policies should be communicated to all persons working for or on behalf of the organization, including contractors working on the organization's facilities. Notification of contractors may take forms other than a direct statement of environmental policy, such as rules, guidelines and procedures, and therefore may include only those sections of the policy that are relevant to them. If an organization is part of a Corporation, the environmental policy should be framed in the context of the Corporation's environmental policy and agreed with its management [14-15].
3.2.2. Development of a program for achieving goals in the dairy industry

The organization must develop, implement and execute a program to achieve the goals in the field of BT and OZ in accordance with clause 4.3.3 of GOST R 54934-2012/OHSAS 18001:2007.

At a minimum, the program should include:

- establishing responsibilities and authority for achieving the goals of the relevant functional structures and levels of management of the organization;
- methods and deadlines for achieving the goals.

The program should be reviewed regularly at scheduled intervals and adjusted, if necessary, to ensure that the goals are met.

In accordance with paragraph 6.2.2 of GOST R ISO 14001-2016, when planning actions to achieve environmental goals, the organization must determine:

- what should be done;
- what resources will be required;
- who will be responsible;
- when these actions are completed;
- how results will be evaluated, including indicators to monitor progress towards achieving its measurable environmental goals.

3.4.3. Development of the procedure "Identification of legal and other requirements"

The organization must identify the legal and other requirements applicable to its environmental aspects, hazards and risks in accordance with clause 6.1.3 of GOST R ISO 14001-2016 and clause 4.3.2 of GOST R 54934-2012/OHSAS 18001:2007. Legal requirements may include requirements of national legislation and international agreements; requirements of state, regional, and industry regulations; and legal requirements of local authorities.

Agreements with authorities, consumers, community groups or non–governmental organizations, requirements of trade associations, recommendations, voluntary codes and principles of established practice, voluntary environmental labeling, product support agreements, publicly accepted obligations of an organization or its parent company, and corporate requirements are all examples of other requirements that an organization can commit to meet in accordance with the requirements of the above-mentioned standards.

In the management system of the dairy industry, regulatory documents containing legal requirements related to environmental aspects, hazards and risks are presented in the "Register of regulatory documents in the field of ecology" and "Register of regulatory documents in the field of BT and OZ". They group documents by level in order of decreasing their legal force:

1. The constitution of the Russian Federation;
2. Federal laws of the Russian Federation;
3. The laws of the Kemerovo region;
4. Decrees of the President of the Russian Federation;
5. Resolution of the Government of the Russian Federation;
6. Orders of the Governor of the Kemerovo region;
7. Regulatory acts of industry and departmental nature;
8. The stakeholders’ requirements;
9. Own requirements of the enterprises of the dairy industry.

The following data sources are used for forming the "Register of regulatory documents in the field of ecology" and "Register of regulatory documents in the field of BT and OZ":

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1. Electronic databases of Federal and regional legislative and regulatory documentation;
2. Official sources publications of Federal and regional legislative and normative documents, such as periodicals, official sites of the President of the Russian Federation, RF Government, ministries and departments of the Russian Federation;
3. Information indexes of standards and other normative documents, as well as information from normative documents (national and interstate standards, sanitary and hygienic requirements, etc.).

4. The requirements of the regulatory documents specified in the "Register of regulatory documents in the field of ecology" and "Register of regulatory documents in the field of BT and OZ" are also applicable to the activities of contractors working on the production sites of a dairy enterprise.

The purpose of the "Identification of legal and other requirements" process is to identify the applicable legal requirements in the field of environmental protection and occupational safety that the organization is required to meet, and determine how these requirements apply to its environmental aspects, hazards and risks in the planning and operation of an integrated management system (IMS).

The sources of information listed above are inputs to the process and are used for compiling the "Register of regulatory documents in the field of ecology" and "Register of regulatory documents in the field of BT and OZ". The input provider is the process of obtaining information from organizations that provide services for the use of electronic databases of regulatory documents.

The output of the process is the approved and up-to-date "Register of regulatory documents in the field of ecology" and "Register of regulatory documents in the field of BT and OZ". The information contained in them is used in the following processes: planning of the organization's activities, identification and assessment of environmental aspects, hazard identification and risk assessment, operations management, emergency preparedness and response, training and training of personnel, assessment of compliance with applicable legal and other requirements. The criterion for the effectiveness of the process is that the company has an up-to-date and approved "Register of regulatory documents in the field of ecology" and "Register of regulatory documents in the field of BT and OZ".

3.4.4. Development of the "Emergency preparedness, accident response"

Procedure the organization should develop a procedure for emergency preparedness, accident response that meets its own needs. When developing this procedure, it is necessary to consider:

1. The nature of hazards at production sites, such as the presence of flammable liquids, storage tanks, compressed gas cylinders, as well as measures taken in the event of spillage (leakage) or accidental releases;
2. The most likely type and scale of accidents and emergencies;
3. The most appropriate methods of responding to emergency or non-emergency situations;
4. Internal and external notification plans;
5. Actions necessary to minimize damage to the environment;
6. Mitigation and response actions taken in various types of accidents or emergencies;
7. The need for the process of assessing the situation after the accident, establishing and implementing corrective and preventive actions;
8. Periodic verification of the implementation of the emergency and emergency response procedure;
9. Training of personnel to act in emergency and emergency situations;
10. List of responsible persons and emergency services, including contact information;
11. Evacuation routes and collection points;
12. Possibility of accidents at nearby facilities;
13. Possibility of mutual assistance from neighboring organizations.
According to the requirements of clause 8.2 of the standard GOST R ISO 14001-2016 and clause 4.4.7 of the standard GOST R 54934-2012/OHSAS 18001:2007, the procedure "Emergency preparedness and response" was developed for the management system of the dairy industry. The purpose of the process is to prevent or minimize the risk of accidents and emergencies, as well as to ensure preparedness for action in such situations, if they occur.

Inputs to the process from the point of view of process approach is the "Register of environmental aspects", "Registry of normative documents in the field of ecology", "Register of significant hazards and unacceptable risks", "Registry of normative documents in the field of BT and OZ" implementation plans for activities undertaken in the framework of corrective actions, preventive actions, Nonconformance management. Processes that supply inputs, identification and assessment of environmental aspects, identification of legal and other requirements, corrective actions, preventive actions, and management of nonconformities.

Output – "plan of measures for prevention of abnormal and emergency situations", used in the following processes: training and training of personnel, infrastructure management, production environment management, monitoring and measurement of processes of occupational safety and health management systems and environmental management.

The performance criteria are the implementation of the "plan of measures for the prevention of emergency situations", the absence of emergencies, and compliance with established standards.

4. Conclusions
1. Documentation of the environmental management system has been developed, such as the procedure "identification and assessment of environmental aspects", "Register of environmental aspects".

2. The documentation of the occupational safety and health protection system has been developed, namely: the procedure "Hazard identification and risk assessment", "Register of hazards and management risks" and "Register of significant hazards and unacceptable risks".

3. Integration of SEM and SM BT and OZ was carried out. Developed: "Integrated policy in the field of ecology and labor safety and health protection; "Program for achieving goals" in the dairy industry, the procedure "Identification of legislative and other requirements", "Register of regulatory documents in the field of ecology", "Register of regulatory documents in the field of labor safety and health protection", the Procedure "emergency preparedness, accidents and response".

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