Some approaches to management and provision of industrial and environmental safety at regional enterprises

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Abstract. The article investigates the challenges of industrial and environmental safety at regional enterprises. It examines the strategies for ensuring these safety areas and identifies the main goals, objectives and implementation priorities for production facilities. The article studies the economic activities of key enterprises of the Volgograd region. The oil and gas, chemical, construction and food production enterprises of different categories of danger were selected as objects of the study. The analysis was based on the following criteria: the sources and level of impact on environmental components, protection measures, environmental policy, industrial and environmental safety. According to the requirements of the current legislation and production controlling the authors proposed the measures for the effective management of the labor protection system and implementation of environmental policies at the industrial facilities.

1. Introduction

For the effective development of any production in regional markets, it is necessary to ensure both industrial and environmental safety. Without sufficient attention to security issues, it is impossible to build a controlling system at an enterprise, make effective management decisions. It is necessary to separate the objectives and component content of the strategic and operational controlling. Using a certain type of controlling in the production process it should be noted that a system of urgent measures for preventing these or other threats is required.

The management of any production process is to be based not only on obtaining sufficient volumes of goods produced and services provided that is crucial for the national economy, but also be safe for the workers, consumers and environment as a whole (Brown, 1999; Grachev, Pliamina, 2018; Mikhailov, Karasev, 2018).

2. Main Part

In the Russian Federation, new industrial and environmental safety strategies that are interrelated with each other will be used up to 2025 (Table 1).

| No. | Name of Strategy | Key parameters for the implementation of state policy in the field of industrial and environmental safety |
|-----|-----------------|--------------------------------------------------------------------------------------------------|
| 1   | Industrial safety | - prevention of accidents and - ensuring the actualization of - development and implementation of uniform |

Table 1: Comparative analysis of the Strategies of industrial and environmental safety in relation to enterprises-users of natural resources
| 2 | Ecological safety | - preservation and restoration of nature;  
- ensuring the quality of the environment necessary for the sustainable development of economy;  
- elimination of the accumulated harm to the environment | industrial safety requirements taking into account the development of technologies used at industrial facilities;  
- cancellation of obsolete, redundant and duplicate industrial safety requirements | criteria for assessing the risk of accidents at industrial facilities and categorizing such facilities;  
- development of industrial safety culture, awareness of personal responsibility for industrial safety and formation of an intolerant attitude towards violations of industrial safety requirements | - introduction of innovative and environmentally friendly technologies, development of environmentally friendly industries;  
- construction and modernization of treatment facilities, as well as introduction of technologies aimed at reducing the volume of air and water pollution;  
- minimization (reduction to the established standards) of risks of accidents at the production facilities and other emergencies |

The considered Strategies are designed to provide the conditions for the maximum reduction of the negative environmental impact of the industrial facilities. It is necessary preliminarily to assess the current situation dealt with an enterprise activity control according to the regulatory requirements concerning the environmental protection and preservation of the sanitary and epidemiological well-being of population [1-29].

To determine the current environmental safety at the industrial facilities, it is necessary to study the dynamics of pollutant inflow into the environmental components. As a result we can speak about the effectiveness of environmental safety at the industrial enterprises (Matveeva, 2016: 4-19).

Taking into account the dynamics of emissions, discharges and waste in the Russian Federation as a whole, it is impossible to make a relevant conclusion towards improving or deteriorating the
environmental situation. The impact of production processes on the environment is constantly increasing, and to minimize the negative effect each company must take a set of appropriate measures. They are used by each enterprise individually based on its specialization, types of harmful factors, climatic and geographical features of the area, and other indicators.

The problem of ensuring industrial and environmental safety at an enterprise is quite acute and requires an immediate solution in a short-term period. This is due to the type of economic growth of the country, poorly developed informational portrait of environmental monitoring, deficiencies in the methodological basis for determining the indicators of environmental safety of some environmental components, as well as a fairly low level of public awareness in this area. The traditional methods of environmental safety management applied at enterprises are sometimes duplicate and not sometimes systematic (Matveeva, 2017: 246-249).

The introduction of industrial environmental monitoring is able to solve partially the problem, however, the state authorities as an administrative resource are still unable to cope with ensuring environmental safety at the industrial facilities. This is due to the fact that there are a number of serious issues: technical and technological resources of enterprises are close to exhaustion, there are inadequate staff qualifications, non-compliance with standards in the design and construction of technical devices and environmental protection equipment, administrative barriers in obtaining relevant permits.

The environmental situation in the regions is unfavorable. The Volgograd region, including the city of Volgograd, can be used as a vivid example. The region belongs to the industrialized regions with large enterprises of the fuel and energy, metallurgical (ferrous and non-ferrous), petrochemical and chemical, agricultural and housing and communal complexes and enterprises for production of building materials. The region has a well-developed transport infrastructure and a network of oil and gas pipelines. Volgograd is a diversified industrial center with a predominance of manufacturing industries.

According to the state registration data, as of January 1, 2018, there are about 46,631 organizations in the Volgograd region, which are distributed by the type of economic activity. At the same time processing industries account for 3119 organizations (6.7%), the degree of depreciation of basic production assets is 41.7% in terms of the aggregate regional industrial production index which is equal to 99.7% compared to the current period of 2017 (Official statistics of the portal Territorial body of the Federal State Statistics Service of the Volgograd region (Volgogradstat)).

Analyzing the economic activities of some city-forming enterprises of the city and region, it should be noted that a systematic approach for ensuring industrial and environmental safety is urgent. It must be based on the classical principles: environmental and economic responsibility, comprehensiveness and economic accounting [1-3].

The assessment of the degree of ensuring environmental and industrial safety during production environmental control at enterprises was carried out according to the following criteria (Matveeva, 2017):

1. The degree of environmental threat in accordance with the category of object of negative environmental impact (NEI).
2. The development of a system of environmental measures to reduce the negative impact on environmental components.
3. The presence / absence of environmental policies.
4. The strengths / weaknesses of an enterprise, as well as threats / opportunities when using the SWOT-analysis method.
5. The development of measures to prevent and eliminate the risk of emergency situations and accidents at work.
6. The presence / absence of an effective labor protection policy at an enterprise in accordance with the established requirements and criteria.
The objects of research were not chosen by chance, since it was important to show different industries and their reference to different objects of negative environmental impact (NEI). A summary of the activity analysis of the selected enterprises is presented in Table 2.

**Table 2:** Final assessment of the degree of ensuring environmental and industrial safety at the studied enterprises of the region

| Name of enterprise / type of activity | Category of object of NEI | Key threats / opportunities | Environmental policy | Control system of labor protection | Safety level on a scale from 1 to 3 (1 - low, 2 - average, 3 - high) |
|-------------------------------------|---------------------------|----------------------------|----------------------|-----------------------------------|---------------------------------------------------|
| Open Joint Stock Company Zenzevyatskiy Elevator /grain processing | II | The lack of resource-saving technologies in the process of grain production / Implementation of developed environmental project documentation in the field of waste management | Present | Present | 3 |
| Closed Joint Stock Company Gazpromhimvolokno /production of cord and technical fabrics | II | Increasing emissions, discharges and waste due to the commissioning of new production facilities and pre-sale cleaning of equipment in workshops / Phased introduction of an environmental management system | Partially present | Partially present | 2 |
| Open Joint Stock Company Volgograd Ceramic Plant / production of building materials and household products | I | The lack of environmental service at the enterprise, no resource-saving technologies for the use of water resources, no closed water supply system / Developed system of nature-conservative measures for organizing and landscaping of the sanitary protection zone | Partially present | Present | 2 |
| LLC LUKOIL-Volgogradneftepererabotka / | I | The increase in the volume of pollutants with the constant intensification of | Present | Present | 3 |
3. Conclusion

A complex analysis of the selected production objects shows that each enterprise has its own problems associated with insufficient funding. For example, the Volgograd Ceramic Factory is characterized by the lack of its own environmental laboratory and environmental specialists and the inability to implement the best available technologies in the production process at the current stage. The economic activities of LLC LUKOIL-Volgogradneftepererabotka have the classical characteristics of successful production process intensification with an annual increase in gross volumes of pollutants into the environment while the strategic objectives in the field of environmental and industrial safety are sufficiently effective. CJSC Gazpromhimvolokno is an industrial object of federal significance which belongs to the category of high-tech enterprises in Russia. At the same time the company has outdated purification technologies that are to be replaced by more modern and highly efficient ones, which is especially necessary due to the introduction of new industries. There are no resource-saving technologies at the grain processing industry, which, as a rule, will be cost-effective at the first stage of their implementation. Most enterprises of the food sector can not afford such technologies because of the low cost of products which are sold on domestic markets.

The controlling system will quantitatively reflect the state of safety at an enterprise and can be used as effective information support in evaluating investment activities in the form of developing measures to improve the state of industrial and environmental safety as well as the labor protection (Eljack, Kazi, 2016; Evtushenko, Siryk, 2016; Idrisova, Myasnikov, 2018).

However, ensuring industrial and environmental safety at regional enterprises is impossible without a systematic approach, which is aimed at developing constructive relationships between the company’s management and legislative and executive authorities.

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