

Aspects of application of a risk-based approach to hazardous production facilities

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Introduction. The paper considers the application of a risk-based approach to improving the level of safety of hazardous production facilities. The presented approach ensures optimal use of labor, material and financial resources, contributes to greater efficiency of state control and supervision bodies.

Problem Statement. The analysis of the state of HPF industrial safety showed the need to change the principles of assessing the state and monitoring the compliance with industrial safety requirements. Reasonable methods should be used to adequately assess the safety of facilities and the frequency and validity of inspections.

Theoretical Part. The use of modern tools for monitoring, collecting and storing information on the state of industrial safety will allow supervisory authorities to plan inspections of hazardous production facilities taking into account their actual condition. This can significantly reduce the administrative burden on businesses.

Conclusions. The use of a risk-based approach in planning inspections will ensure a higher level of industrial safety without involving additional resources of regulatory authorities.

Keywords: hazardous production facility, HPF, industrial safety, hazard classes, risk-oriented approach.

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Introduction. The level of safety of hazardous production facilities on the territory of Russia is determined by many factors. Among them there are personal interest of owners and operating organizations in ensuring safety, trouble-free operation of equipment, technical devices, the condition of buildings and structures, in creating jobs that meet safety requirements, attracting qualified specialists, and so on.

Problem Statement. Problems of industrial safety, equipment wear and maintenance of an adequate level of industrial safety are reflected in Decree of the President of the Russian Federation dated 06.05.2018 No. 198 "On the state policy of the Russian Federation in the field of industrial safety up to 2025 and beyond"¹.

It should be noted, that the level of safety at the HPF is steadily increasing, and the number of accidents and fatal injuries is decreasing². At the same time, the catastrophic condition of the equipment and technical devices used at the HPF is recorded: 60-70 % of them have fulfilled the standard service life, and in this situation, the annual damage from accidents can reach 600-700 billion rubles.

The data from reports on the activities of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia³ allow us to generalize the causes of accidents and injuries at the HPF:

- incorrect design decisions or lack of them,
- wear and tear of technical devices, equipment, buildings, structures,
- untimely maintenance and repair of technical devices,
- low level of qualification of managers, responsible performers, maintenance and repair personnel,
- erroneous decisions and actions,
- violation of industrial safety requirements.

¹ Decree of the President of the Russian Federation dated 06.05.2018 No. 198 "On the fundamentals of the state policy of the Russian Federation in the field of industrial safety for the period up to 2025 and beyond". Collection of Legislative Acts of the Russian Federation. 14.05.2018, No. 20, article 2815.

² Ibid.

³ Annual report on the activities of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia in 2018. Rostekhnadzor. Available from: http://www.gosnadzor.ru/public/annual_reports/Годовой%20отчет%20за%202018%20год.pdf (Accessed 5th April 2020).

Theoretical Part. One of the tasks of the state policy in the field of industrial safety⁴ — is to introduce a risk-based approach to the organization of federal state control and supervision in the field of industrial safety. A special law regulates this area⁵, according to which the risk-based approach is a special method of organizing and implementing state control (supervision). In this case, the activities of a legal entity, individual entrepreneur, and (or) production facilities are assigned to a certain category of risk or a certain class (category) of danger. Depending on the category (class), the intensity (form, duration, frequency) of measures is selected for monitoring and preventing violations.

In order to optimize the use of labor, material and financial resources involved in the implementation of state control (supervision), reduction of costs of legal entities and individual entrepreneurs and improvement of the performance of state control (supervision), it is necessary to apply a risk-based approach.

Currently, HPFs are classified as one of four hazard classes⁶, taking into account the potential risk of accidents and their consequences. As of December 29, 2018, according to Rostekhnadzor⁷, there were registered in Russia:

- about 2 thousand objects of the I hazard class (extremely high),
- more than 7.7 thousand objects of the II hazard class (high),
- more than 89 thousand objects of the III hazard class (moderate),
- more than 70 thousand objects of the IV hazard class (low).

Statistics show that the main part of the recorded HPFs belongs to the III and IV hazard classes. Hazard classes correspond to the requirements of industrial safety included in supervisory activities. The control over the compliance with industrial safety requirements by owners and operating organizations determines the frequency of including a scheduled inspection in the annual plan starting from the day of the⁸:

- a) decision to put a hazardous production facility into operation (taken in accordance with the procedure established by the government of the Russian Federation);
- b) registration of a hazardous production facility in the state register of the HPFs;
- c) end of the scheduled inspection.

Routine inspections of HPFs of the I or II hazard classes should be carried out no more than once a year, and of the III hazard class — no more than once every three years. HPFs of the IV hazard class are not regularly checked.

Unscheduled inspections are carried out only on complaints of organizations and people in connection with safety requirements violations, threats to life and health as a result of activities at the facility.

Thus, the attention of the Supervisory authorities to the HPF is not evenly distributed. At the same time, accidents continue to occur (destruction of technical devices and (or) structures, uncontrolled explosions or releases of dangerous substances⁹).

Special attention should be paid to the objects of the IV hazard class. Their exemption from periodic inspections led to the loss of information about the activities of such HPFs, the condition of buildings, structures, technical devices, technological processes, etc. The only source of information about HPFs is the report on production control of compliance with industrial safety requirements. HPFs that do not provide such reports become "invisible" to supervisors.

Issues of assigning a higher hazard class to individual HPF are periodically discussed. Appropriate decisions

⁴ Decree of the President of the Russian Federation No. 198 dated 06.05.2018.

⁵ Federal law No. 294-FZ of 26.12.2008 (as amended on 01.04.2020) "On the protection of the rights of legal entities and individual entrepreneurs in the course of state control (supervision) and municipal control". State Duma; Federation Council. Available from: http://www.consultant.ru/document/cons_doc_LAW_83079 (Accessed: 2nd April 2020).

⁶ Federal law No. 116-FZ of 21.07.1997 (as amended on 29.07.2018) "On industrial safety of hazardous production facilities". State Duma of the Russian Federation. Available from http://www.consultant.ru/document/cons_doc_LAW_15234 (Accessed: 7th April 2020).

⁷ Annual report on the activities of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia in 2018.

⁸ Federal law No. 116-FZ of 21.07.1997 (as amended on 29.07.2018).

⁹ Federal law No. 116-FZ of 21.07.1997 (as amended on 29.07.2018).

are usually made in connection with frequent accidents. Therefore, in 2017-2018, due to a series of accidents during the operation of tower cranes, regulatory documents were amended ¹⁰, making the participation of Rostekhnadzor obligatory in the decisions to put tower cranes into operation. The changes to the legislative documents on assigning the third and higher hazard class to HPFs operating tower cranes are considered. This will make it possible to carry out supervision on a scheduled basis [1-3].

When it comes to the need to organize scheduled inspections of HPFs, entrepreneurs, supervisors, and leading experts in the field of industrial safety disagree [4]. The government opposed the initiation of frequent inspections by the Supervisory authorities. There is still a discussion about the inadmissibility of a generalized approach to HPFs, even of the same hazard class.

The risk-based approach will allow the Supervisory authorities to individually consider a specific enterprise and its level of industrial safety, which will serve as the basis for planning inspections. Decree No. 198 mentioned earlier notes that one of the tasks of the state policy in the field of industrial safety is to "develop and implement information technologies that allow interaction with operating organizations, optimize the process of obtaining, storing and analyzing information on industrial control over the compliance with industrial safety requirements, on industrial safety management systems, on accidents and incidents at industrial facilities".

Information technologies are actively used in document management, including in the field of industrial safety [5, 6]. Submission of reporting documentation to the state authorities (in particular, reports on production control in the territorial department of Rostekhnadzor) allows you to define key performance indicators of compliance with the industrial safety requirements of a specific HPF [7-9], namely:

- signs of danger
- hazard class
- license,
- Industrial Safety Declaration,
- characteristics of technical devices and equipment (year of manufacture, number of owners, residual resource, technical inspection, repairs, unit replacement, examination of industrial safety, etc.)
- condition of buildings and structures (industrial safety expertise),
- contract for insurance of liability of the owner of a HPF for damage caused as a result of an accident,
- the company has special security specialists in the company's staff (name, education, advanced training, certification),
- the company has employees to manage, maintain and repair technical devices (name, education, clearance to work unsupervised).

Depending on the category of the HPF, its hazard class and types of activity, the list of information can be supplemented. A risk-based approach will allow you to:

- 1) distribute the workload of regulatory authorities more effectively,
- 2) focus on distressed businesses,
- 3) reduce the burden on bona fide enterprises (minimal risk of an accident),
- 4) adjust the number of checks depending on the data received.

¹⁰ Order of Rostekhnadzor of 12.11.2013 No. 533 (as amended on 12.04.2016) "On approval of Federal norms and rules in the field of industrial safety "Safety rules for hazardous production facilities where lifting structures are used". Federal Environmental, Industrial and Nuclear Supervision Service of Russia. Available from: http://www.consultant.ru/document/cons_doc_LAW_157709 (Accessed 7th April 2020).

Conclusion. The use of a risk-based approach in the planning of inspections will ensure a higher level of industrial safety without involving additional resources of regulatory authorities. This approach will ensure constant monitoring of hazardous production facilities that do not comply with industrial safety requirements.

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E. V. Egelskaya — scientific supervision, formulation of the main concept, goals and objectives of the study, preparation of the text, correction of conclusions; M. Yu. Romanenko — analysis of research results, revision of the text, formulation of conclusions.