

# Role of employee motivation in an industrial occupational risk management system

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**Abstract.** This paper explains the importance of the issue related to motivating safe personnel behavior in the modern industrial system of occupational risk management. The medical condition of production workers as a part of the society that ensures the basis of its economic welfare is the foundation of the social policy of any state. Today, the main goal of occupational health and safety is switching to a modern occupational risk management system, which has to be scientifically justified, informative, objective, easy to understand to ensure its application both at the level of managers and specialists and at the level of laborers, and factor in the occupational risk, motivation, and competency of every worker. This can be facilitated by using an efficient method of encouraging safe working techniques through weekly assessment of an employee's personal or active component determined according to the results of analyzing the information received from this employee concerning the identified sources of hazard, incidents or emergencies, and improving health and safety conditions. Safety of a significant part of labor processes particularly depends on the accurate, prompt, and correct reaction of an employee to particular events that occur in the process of working. Furthermore, it is necessary that the knowledge necessary for these types of situations are firmly fixed in one's consciousness and the respective skills are well developed. According to the proposed formula, the amount of an employee's occupational risk is directly proportional to the average occupational risk value and inversely proportional to the product of the indicators of one's competence and motivation. Developing an efficient mechanism of personnel motivation and training in an organization's occupational risk management system as well as justified and efficient methods of competence control and assessment will allow to reduce the number of injuries caused by unsafe actions of employees and substantially decrease the level of occupational risk within enterprises.

## 1. Introduction

The medical condition of production workers as a part of the society that ensures the basis of its economic welfare is the foundation of the social policy of any state. According to the Articles 7 and 37 of the Constitution of the Russian Federation, people's labor in health in our country are protected and every person has the right to work in the conditions that meet the requirements to safety and hygiene and not be subject to any sort of discrimination.

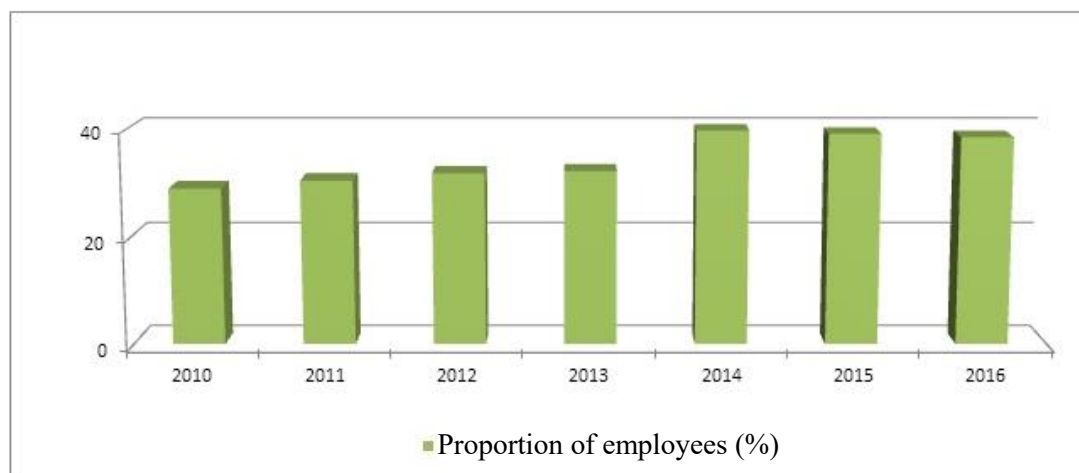
At the present moment, a large base of legal and regulatory documents, analytical research, and publications has accumulated in the area of occupational health and safety, however, the right for safe



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industrial labor secured in the legislation is not ensured and bears a mostly declarative nature, which is connected with a significant optimization of the regulating authorities that are supposed to solve this high-priority constitutional task.

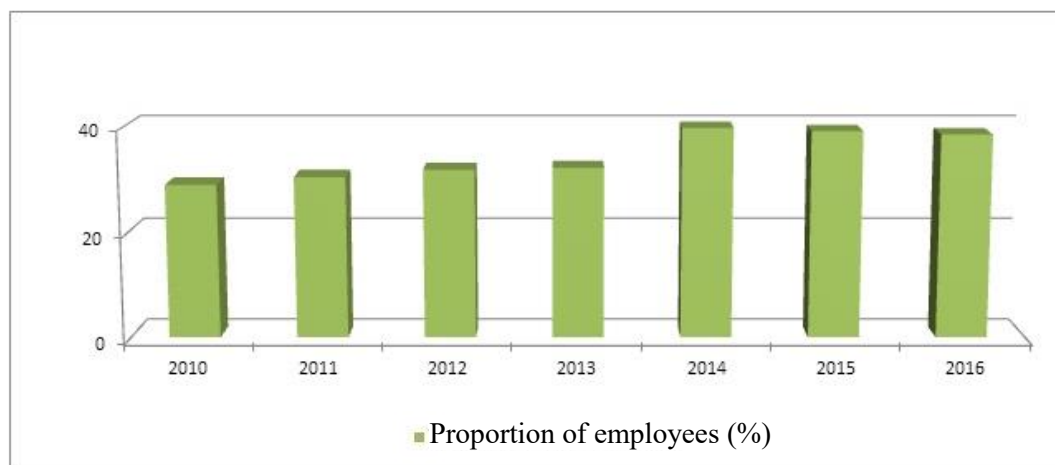
The proportion of people working in medically adverse work environments causing the development of industry-related occupational conditions shows an increasing trend (Figure 1).



Years	2010	2011	2012	2013	2014	2015	2016
Proportion (%)	29	30,5	31,8	32,2	39,7	39,1	38,5

**Figure 1.** The proportion of people working in unhealthy and (or) hazardous working conditions.

At the same time, it should be noted that according to the latest data from the Social Insurance Fund of the Russian Federation (SIF RF) about loss events, a slight dynamic towards reduction in work-related injuries is observed (Figure 2).



Years	2010	2011	2012	2013	2014	2015	2016
Proportion (%)	29	30,5	31,8	32,2	39,7	39,1	38,5

**Figure 2.** Statistics of occupational injury rate: loss events registered by the executive bodies of the SIF RF.

Today, the main goal of occupational health and safety is switching to a modern occupational risk management system (ORMS), which has to be scientifically justified, informative, objective, easy to understand to ensure its application both at the level of managers and specialists and at the level of laborers, and factor in the occupational risk, motivation, and competency of every worker [1].

## **2. Motivation of employees is an important mechanism in an industrial occupational risk management system.**

Employees' incompetence and lack of motivation are the source of 93-97% of cases of injuries related to the negative impact of the so-called "human factor": improper organization of work performance and preparation of workstations, violation of safety regulations when using tools, machines, and mechanisms, departure from duty regulations and operating procedures, and other reasons [2, 8].

It should be noted that an important role in the formation of the irresponsible model of behavior in terms of occupational health and safety is the existing social and physical impunity of the employee performing the unsafe actions. Physical impunity results from that such actions are not always accompanied by trauma, which facilitates negligence to the possibility of suffering one, while social impunity comes from the indifferent attitude to the issues of workplace safety inside the enterprise, which forms a false concept of personal invulnerability.

The task of motivation within an ORMS is to raise safety to the level of permanent requirement in the mind of an employee; only then will it become a driving factor. An efficient mechanism of motivation should become the main link in the organization's ORMS and be designed both for each employee and for particular groups of team members with similar dominant needs. Monitoring these

needs is a necessary requirement for the functioning of the motivation mechanism for determining stimulating incentives [3, 4].

One of the ways of reinforcing the motivation for safe labor is the psychological disposition towards safe behavior in the carrying out one's labor functions. The main difficulty of behavior in the context of a hazardous situation lies in its detection, analysis, and choosing an appropriate response. Time limits that usually arise in such situations and the high cost of mistake make a hazardous situation emotionally tense. To identify a person's attitude to different tasks and workplace safety situations, the ORMS must determine the meaning that this person puts into such situations and conditions, one's competence, and, above all, the motivation in the process of problem solving, which is a very important issue.

Safety of a significant part of labor processes particularly depends on the accurate, prompt, and correct reaction of an employee to the negative factors that occur in the process of working. Furthermore, it is necessary that the knowledge necessary for these types of situations are firmly fixed in one's consciousness and the respective skills are well developed. It is possible to increase the level of an employee's qualification in the area of occupational health and safety and the level of one's emotional stability during stress events caused by the emergence of negative factors at the workplace by designing special training programs that include using virtual simulators that account for the professional specifics and the degree of hazard from the technological processes [5, 11].

Reliable personnel that is motivated in terms of workplace safety is a key component in ensuring the industrial ORMS efficiency and safety in all types of activity.

The decisive effect upon the motivation of employees for safe practices can come from remuneration systems where incentive compensations or other measures of additional compensation are introduced with the goal of expansion of production, or when the organization shifts towards piece-work remuneration scheme. Each of these measures leads to departures from safe working procedures with the purpose of increasing one's salary [6]. The success of the implementation of remuneration schemes in terms of motivating employees to work safely is measured by virtually the only and very unreliable criterion: the change in the statistics of negative events: reduction in the number of injuries or their complete absence [7, 9]. Since accidents and emergencies occur rather rarely, quite a long period can pass before the necessary measures will be taken and significant changes for the better will occur.

Employers usually resort to stimulation programs through remuneration systems to avoid displaying the lack of an efficient system of occupational risk management in the enterprise or to solve the long-term production issues that require a more fundamental approach than monetary stimulation. As a consequence, malpractices appear at the level of individual employees (team leader, specialist, or laborer), whose main form may be the attempt to conceal cases of breakdowns or injuries out of fear that otherwise both the employee oneself and the whole team will lose their incentive payments. Concealment of accidents by employers and the unwillingness to pay more for negative performance are further facilitated by the approach established by the order of the Ministry of Labor and Social Protection of the Russian Federation of 01.08.2012 No. 39n, which is intended for the SIF RF to calculate discounts or surcharges to the "traumatism fee". For instance, the amount of a discount of surcharge (up to 40%) to the insurance tariff is affected by the factors of frequency and severity of injuries identified in an organization during the accounting period.

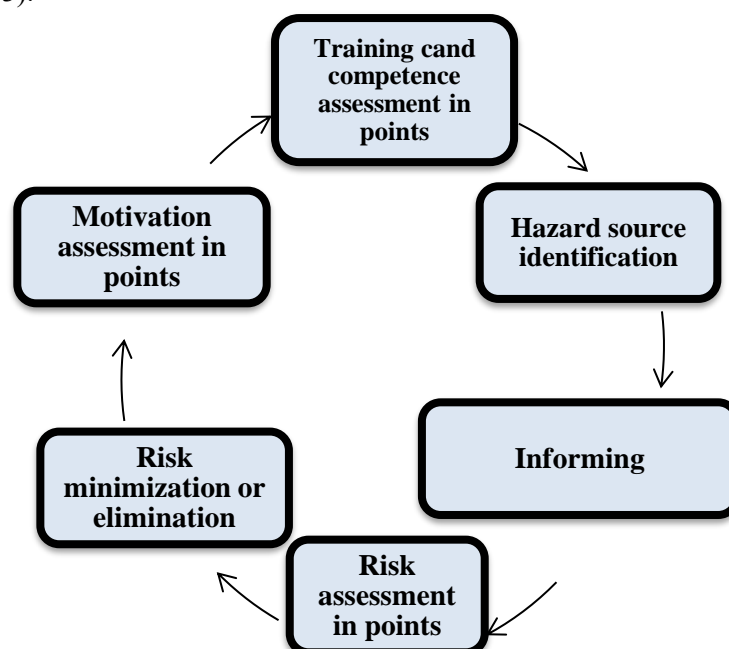
The success of the introduction of the mechanism of motivating employees for safe practices will largely depend on the efficiency and nature of the employees' involvement in the ORMS established in the enterprise and their correct apprehension of this phenomenon. If the system is hard to understand, its goals are too high, or the personnel does not notice the influence of their efforts on the results, there will be no effect. Also highly significant is the time interval between the assessment of the system's output and receiving the bonus: the longer it is, the less authority the motivation mechanism likely commands. It is very difficult to keep an employee interested in and unclear system according to which one is not getting a pay rise for several months while being required to make no violation of the safety requirements the whole time through a "stick" approach.

If the goal is to preserve the employees' high level of motivation and active involvement in the ORMS, its rewards should come quick enough and the criteria of assessment of compliance to safety requirements should be sufficiently exact and clear, and so must be the information about their current status. According to the research, rewards for achievements that signalize the recognition of competence are valued higher than those that are simply a response to carrying out instructions from superiors [12].

Positive stimulation is more practical and effective. The international experience shows that introducing rewards for following safe working practices is a more effective means of increasing workplace safety and not only increases the motivation for safe behavior but also facilitate the entrenchment of good work results and selection and reinforcement of the best and safest ways of working in a person's mind. Moreover, it is better if rewards, assigned through weekly assessment of the employee's personal and active components determined according to the results of analyzing the information received from this employee concerning the identified sources of hazard, incidents or emergencies, and improving health and safety conditions, are issued at once, because the longer is the delay, the lower the effect from such incentive. At the moment, the Labor Code of the Russian Federation (Article 136) does not prohibit issuing employees such rewards.

The policy of facilitating safe working conditions should be aimed at the collective search for ways of preventing accidents by everyone involved in the process of production at all its stages. Identifying risks is a complex task and is thus carried out by managers and specialists with involvement of the laborer collective through adhering to the common principle of teamwork: M-S-W (manager, specialists, workers) [10,13].

After receiving special training, each employee, on their place inside the ORMS, can carry out continuous identification of the detected hazards, assessment of probable occupational risks, and perform the actions for their minimization or elimination as recommended by the management. Systematically, the process of occupational risk management can be represented in the form of six main steps (Figure 3).



**Figure 3.** Diagram of process-based occupational risk management.

### 3. Formula of an employee's occupational risk assessment.

The average occupational risk value for specific profession or position in a team is determined as a ratio of the sum of the values of all risks to the number of risks using the following formula:

$$R_{av} = \sum_{i=1}^n \frac{R_i}{n}, \quad (1)$$

where  $R_i$  is the value of i-th risk for the profession (position);

$n$  is the number of risks for the profession (position).

At the same time, the amount of an employee's occupational risk is  $R_{eor}$  directly proportional to the average occupational risk value and inversely proportional to the product of the indicators of one's competence and motivation:

$$R_{eor} = R_{av} / K \cdot M, \quad (2)$$

where  $R_{av}$  is the average value of occupational risk;

$K$  is the indicator of the employee's competence level;

$M$  is the indicator of the employee's motivation level.

#### 4. Conclusion

An employee's occupational risk can be assessed as the probability of suffering a bodily injury as the result of the effect of hazardous and (or) unhealthy occupational factors while performing one's employment duties or other lawful activities on behalf of the organization or individual entrepreneur. Designing an efficient mechanism of motivating safe working practices would reduce the number of injuries caused by hazardous actions of employees and significantly decrease the levels of occupational risks in enterprises [14].

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