Analysis and Evaluation of Factors of the Production Environment and Labor Process during a Special Assessment of Working Conditions in Company “NPO SM”

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Abstract. The aim of this study is to analysis working conditions of workers at workplaces by factors of the working environment and a labour process, also the development of measures for their improvement. In the study a special assessment of working conditions (SAWC) was carried out, harmful working factors were found, also factors of a labour process were surveyed and measures for their improvement were developed.

1. Introduction

The order of regulation of relations in the field of labour protection is defined Labour Code of the Russian Federation, enacted on the 30th of December 2001 (ed. from 01.04.2009), № 197-FL (Federal Law of December 28, 2013, № 421-FL article 212 of this Code has been amended, which start to work on the 1st of January, 2014). Article 212 of the Labour Code of the Russian Federation makes the employer to guarantee safe working conditions and labour protection at the enterprise [1-3].

On the basis of the Federal law of the Russian Federation of 28.12.2013 № 426-FL (ed. from 27.12.2018) “About a special assessment of working conditions” company “NPO SM” conducts a special assessment of working conditions at the workplace. SAWC has been finished and the study will be conducted based on its results [3-5].

The special assessment of working conditions includes hygienic assessment of the existing working conditions and a nature of work, accounting of providing of workers with personal protective equipment (PPE), also the efficiency of the equipment [6]. The period of carrying out of the SAWC is set from changes of conditions and the nature of work, at least once in 5 years [7-9].

One of the main declared postulates of the special assessment of working conditions (SAWC) is a transition from “list” approach to providing guarantees and compensations to workers of harmful and dangerous factors of the working environment and the labour process. Besides, the results of the SAWC should be taken into account when assessing the level of professional risks, an organization of medical examinations, an accident investigation and occupational diseases during providing workers with PPE, during the development and realization of the measures, aimed at proveing the working conditions of workers [8, 10-12].
The aim of the study is to make an analysis of harmful and dangerous working factors (according to the results of the SAWC in company “NPO SM”) and a development of recommendations for improvement and sanitation of the working conditions.

During the study the following problems will be solved:
- acquaintance with the basic normative legal acts in the SAWC;
- an organizational basis of a workplace assessment;
- a method of assessment of the working environment factors and a labour process in company “NPO SM”;
- an analysis of workers’ working conditions;
- a development of measures for improvement of working environment factors and a labour process.

2. Methods
A special assessment of working conditions includes a hygienic assessment and an assessment of providing of workers with personal protective equipment.

In accordance with the order of carrying out of the SAWC all harmful and dangerous working factors which are available at the workplace are subject to hygienic assessment: physical, chemical and biological [13,14].

The hygienic assessment of the present position of working conditions is made on the basis on the agreement of the measured results of the working environment factors a labour process with established hygienic standards for them [15].

Based on the current classification of working conditions, set the class of working conditions and a degree of harm or dangerous working factors, also for the whole workplace.

According to the order of execution of the SAWC, providing of workers with personal protective equipment, is carried out by comparing the fact of the funds provided with the standards of free issuance to workers special clothes, special shoes, including washing off and neutralizing means and rules approving in accordance with the established order.

The assessment of the working environment factors and a labour process of workers will be evaluated by the following methods:
1. The assessment method of the parameters of the light environment at the workplaces.
2. The assessment method of the severity of the labour process.
3. The assessment method of the intensity of the labour process.

3. Results
The assessment method of the parameters of the light environment at the workplaces is determined according to the State Standards of the Russian Federation (SSRF) R 54944-2012. “Buildings and structures. Method of light measurements”.

Before, make a measurement, need select and apply control points for light measurements on the plan of the room, the structure or the illuminated area indicating the location of the lamps.

To do this, the room index i’ is calculated by the formula:

\[ i' = \frac{a + b}{h_0(a + b)} \]  

Where “a” is the width of the room (m); “b” is the length; “h” is the height of the suspension of lamps. Minimum number of control points “N” for the measurement of average illumination is a tabular mean.

The illumination at the workplace is determined by direct measurements in the plane specified in the standards of illumination or on the working plane of the equipment.

The severity assessment of the labour process is carried out on a number of indicators, characterizing the labour process, regardless of personal characteristics of workers, taking part in this process. Such indicators are expressed in ergometric values. The main ones are:
- physical dynamic load;
- weight of raising and moving loads in manual;
- stereotypical working movements;
- static load;
- working posture;
- the slopes of the body;
- moving in space.

Each of these indicators must be recorded quantitatively and analyzed in accordance with the Order of the labour Minister of RF of 24.01.2014 № 33n “About an approval of the methodology for special assessment of working conditions, classifier of harmful and dangerous working factors, report forms of carrying out SAWC and instructions on its filling”. Also, each indicator requires its own approach. An example of this was the assessment of profession installer of metal structures.

The intensity of the labour process is also analyzed in accordance with the Order of the labour Ministry of the RF of 24.01.2014 № 33n.

The measured parameters of the intensity of the labour process are:
- sensor loads;
- monotony of loads.

As an example, an assessment of the tension parameters of the labour process for a leading specialist of the marketing department at company “NPO SM” was carried out.

Conclusions of the assessment of the current position of working conditions at the workplace are entered in the Map of the special assessment of working conditions, after that, the commission of the organization makes a conclusion about the results of the SAWC in the map.

According to the results of the SAWC at the workplaces in company “NPO SM” was assigned a class of working conditions 3.1 on indicators of the severity of the labour process for profession, installer of metal structures, due to exceeding of the permissible standards of the indicator of the labour process severity, such as the working position of the worker’s body during the working day.

Number of installers of metal structures in company “NPO SM” there are 7 workers, which is 5% of the number of workplaces, where the SAWC was carried out.

On indicators of tension, only forwarding drivers have a class of working conditions 3.2, is 2.9% of the number of workplaces (4 workers).

All other workers have optimal working conditions they don’t exceed normative values of the levels of measured and investigated factors.

According to the indicators of illumination of the workplaces, deviations weren’t found.

According to the results of the SAWC the following recommendations for the improvement of the working conditions are developed:
- Recommendations for the normalization of the severity of labour.
- Recommendations for the normalization of the of labour intensity, including:
- actions, aimed at reducing the stress position of workers;
- actions, aimed at reducing the sensory loads of workers;
- actions, aimed at eliminating the adverse effect of monotony on administrative workers.

4. Discussion

Violation standards’ labour protection in the process of the working activity leads to non-compliance standards requirements, with regard to the working conditions and the manufacture of products. So it’s very important to provide the required standards, norms and rules of the labour protection at all stages of production [16].

So, summing up the results of this study, we can make the following conclusions.

The analysis of the working environment factors and the labour process in company “NPO SM” showed good results. A small number of workers were found exceeding the norms of indicators of the labour process factors.
There are no problems with illumination at the enterprise, it will help to avoid many diseases in the future, caused insufficient illumination of workers [17-19].

Actions for the normalization of the working conditions were discussed above. After carrying out the described actions it’s necessary to carry out additional measurements of the factors, to which the actions were directed. Additional measurements are carried out to check the effectiveness of the actions and to establish the appropriate class of the working conditions at the workplaces [16, 20-22].

Besides, the main causes of possible accidents at work are reasons of the organizational nature, violations of safety requirements, unsatisfactory organization of work, shortcomings in the learning of workers to the labour protection, violations of labour discipline [23-26].

Due to it, it’s very important to provide the labour protection at the enterprise [27,28]. During the working process the general requirements of the labour protection must be completed, described in the Labour Code of the Russian Federation and other legislative acts, also the rules and the safety instructions for a specific type of work and each individual specialty.

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