

## INTERNAL SOURCES OF RISK IN BUILDING EMPLOYEES' ATTITUDES OF SAFE WORK IN METALLURGICAL ENTERPRISE

Received – Prispjelo: 2012-06-11  
Accepted – Prihvaćeno: 2012-10-15  
Professional Paper – Strukovni rad

The aim of the article is the identification of the internal sources of risk in the process of improving the system of safety and work hygiene management. After conduction of the analysis the conclusion is that the significant source of risk in the process of improvement of safety and work hygiene management is the human factor and, in particular, the lack of employees' awareness concerning the importance of their attitudes in the improvement of the system.

*Key words:* internal risk, system of safety and work hygiene management, metallurgical enterprise, employees' awareness

### INTRODUCTION

Care about health and life of the employees in enterprises is one of the necessary conditions to conduct business activity. Legal regulations in force impose on the employer the obligation to provide the employees safe work conditions. The activities of the employer require the support from the employees. The workers of all levels in an organisation need to be aware of the ways of safe performance of their work and the safety rules which are in force on the premises of an enterprise. It is, therefore, indispensable to build the awareness of the employees efficiently in the area of safety and work hygiene management. One of the main stages of efficient construction of attitudes of safe work among employees is the necessity to identify the threats which hamper or make the achievement of the goal, which is "no accident production", impossible. The aim formulated in such a form is a long-term process which requires a lot of actions aimed at the human factor. It is estimated that more than 60 % of the incidents which are potentially accident prone are caused by human factor (sometime even 70 %). The remaining 40 % (sometimes less) is caused by technical and organisational aspects [1].

In the light of so huge risk coming from human factor the following research problem has been constructed: what are the sources of risk which hamper or prevent the workers from acceptance of the safe work attitude.

### RISK IN THE LIGHT OF LITERARY STUDIES

In modern, changeable surrounding risk management in business activity becomes very important. The notion of risk is understood as the probability of suffering a loss by business entity as a result of making a certain economic decision [2]. Generally speaking, risk is the probability of not achieving in a given business activity the anticipated economic results, profits or the danger of suffering losses, exceeding the expenditure on investments etc. [3] Risk is to inability to achieve goals which are assumed by the enterprise. Risk refers to repetitive phenomena which can be calculated up to a point and can be foreseen. In business activity of the enterprise there are various categories of risk to be found. Risk is the factor that may refer to any activity of the enterprise. If the enterprise uses a bank credit then it is under credit risk. Functioning on the international market the enterprise is at risk connected with foreign currencies (*foreign exchange risk*) subjected to changes of exchange rate which is often called *exchange rate risk* [2] In relationships with the supplier there is *delivery risk*, which is the risk of rejecting a given product batch during testing of their technological and quality parameters, risk of unpunctuality of the deliveries, incomplete deliveries, overpricing by the supplier etc.[4] Another category of risk refers to investments because the estimation of the income from a given investment with absolute certainty is impossible, because the subjective probability should be used in the assessment of expected profits and losses [2]. Risk may refer to implementation of strategic aims of the enterprise (*strategic risk*). M.E. Porter identifies strategic risk in sectoral activities of the enterprise. Particular categories of risk correspond with the analysis of 5 forces of M. E. Porter [5]. In management risk should be taken into account in decision-making process in case of any level of mana-

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gerial staff in the organisation [6]. In systems of safety and work hygiene management the analysed and assessed type of risk is occupational risk. According to the directives of ILO-OSH 2001 the occupational risk is the combination of the probability of occurrence of the events which endanger workers and the effects such events have on the worker (seriousness of injury, deterioration of health).

## SOURCES OF RISK IN BUILDING THE AWARENESS OF SAFE WORK

Identification of the risk sources is the first stage in risk management. This first stage is considered the *essentialia negotii* of efficient improvement in safety and work hygiene management system. Risk identification is the process of systematic and continuous recognition of the risk sources in business activity of the company the effect of which is description of areas in which the risk may occur [7]. For each risk area there should be some defined events which lead to occurrence of dangers and losses [8]. In safety and work hygiene systems these can be events which block the efficiency of activities in enterprise; events, the occurrence of which is the reason of losses or events which cause deterioration of health condition of workers or even the loss their lives. Occupational risk is conditioned by work environment and the way the work is conducted. Generally speaking, there are three basic sources of risk in safety and work hygiene management systems: human, equipment and organisation. For each source of risk there are the following categories of dangers: human danger, technical danger and organisational danger. As it was mentioned above, over 60 % of events which are potentially incidental is caused by people.

Therefore, the implementation of the building employees' awareness concept in systems of safety and work hygiene in the enterprise is really justified. N. Silamy in his dictionary of psychology defines the awareness and the knowledge which a human possesses about their existence, their actions and the outer world [9]. For Bergson the awareness is the attention, for Z. Freud it is perception, for Jung it is wakefulness, and for Soren Kierkegaard it is self-knowledge. Awareness shapes attitudes which are applied towards someone or something. In psychological approach the demeanour includes conglomerates: valuating, emotional and behavioural. In common understanding the demeanour is the attitude. The attitude of safe work is the approach of the workers to the way they perform their work with the use of methods which do not threaten both their own health and lives and the health and lives of the other workers. Both the awareness and the attitude of safe work are significant conglomerates of safety and hygiene management system in an enterprise, particularly in manufacturing enterprise. There is a close connection between the attitude of the employees to their work and the number of accidents in the enterprise (this argument is the basis for research in

the next part of the publication). The deciding factor in case of workers is the amount of possessed knowledge and engagement in what they are doing [10]. The elements of knowledge in the system of safety and work hygiene management are: systematic knowledge which is substantial knowledge of employees in the field of systematic management of work safety, operational knowledge – knowledge concerning safe methods of working and individual knowledge of each worker which allows him or her to perform the job on a given post in a safe way. Lack of awareness is always the cause of negative actions. An employee who does not apply safe work methods on a daily basis will not be convinced about their significance and they will not become a habit for him or her, such worker will bring about accidents or will contribute to their occurrence. The awareness of the safe work methods should be visible not only in psychological area (paradigm of imagination) but first and foremost in real behaviour (paradigm of action) [11]. Modern employees must be creative [12]. They must solve problems in work themselves [13].

Looking for the main risk sources in building the attitude of safe work one should pay attention to: motivators, training, communication, team work, employees' engagement etc. It is therefore a set of activities from the area of human resources management. In the area of motivators there are positive elements (awarding the right attitudes) and negative (punishing the improper working methods or behaviour). Trainings are divided into obligatory, which result from the legal regulations concerning work, and additional. The subject range is very varied and may refer strictly to methods of working as well as safe behaviour in a workplace. There are certain forms of training such as, among other types, instruction trainings, shows, interviews, case study analyses, lectures etc. Trainings may take place on the premises of the enterprise (in-job) and outside the premises (out-job) [14]. In case of communication system the multilateral methods are important here (horizontal, vertical, superior and rank-and-file) together with the variety of communication forms. Managers interview workers to get to know their problems in work [15].

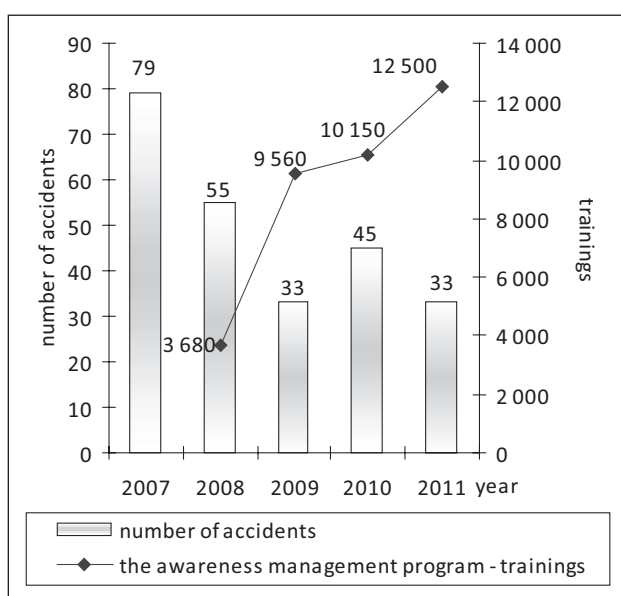
Sources of risk may be found also in team work. Low integration level in a team, conflicts, improperly chosen members of the team are only some examples of risk sources. In systems of managing work safety the emphasis is also put on employees' engagement understood as co-decision making of workers concerning the place they work in and the improvement of the workplace. It is commonly assumed that the lower the engagement of the employees in taking care about the workplace the bigger the amount of the events potentially incidental and the worse the organisation of work (assumptions of application the 5S method). The analysed list of internal sources of risk in the process of building employees' attitudes of safe work does not present the whole notion of human resources management in context of work safety improvement.

## BUILDING EMPLOYEES' AWARENESS IN METALLURGICAL ENTERPRISE

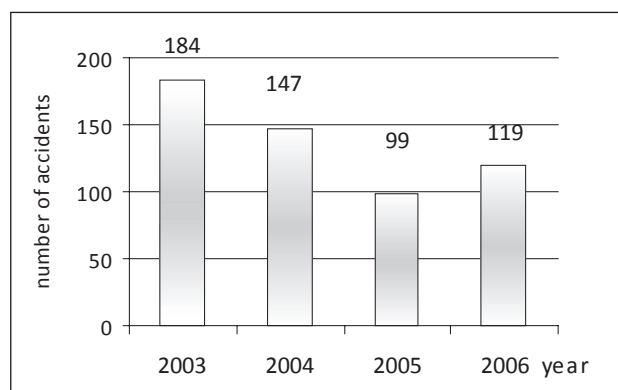
The program of workers' awareness management in metallurgical enterprise ArcelorMittal Poland has been initiated in 2007. The program is a part of safety and work hygiene management system. The key elements of this program, in first years of its implementation, were trainings. The trainings consist of program „minutes for safety”, behaviours audit, trainings after work accidents etc [16]. Number of participants of awareness management trainings systematically rose. In 2008 it were 3680 employees and in 2009 it were 9560 employees and in 2010 it was 10150, in 2011 it were 12500 employees. A group of 65 % of physical workers underwent trainings concerning safety and work hygiene. The remaining groups of participants of trainings were managerial staff, administration staff, subcontractors, workers who operate devices, internal work safety service staff.

Some of the participants of trainings on employees' awareness management in the topic of work safety became team leader in the so-called support teams when they completed their training. The members of the team reminded the other workers about the basic rules of safe work (direct conversation) and also got to know the problems in the workplace. The members of advising teams are also members of post-accident investigations. The increase in the number of employees participating in trainings was compared with the number of registered accidents at work (Figure 1) in view of a connection between trainings and the number of registered accidents at work.

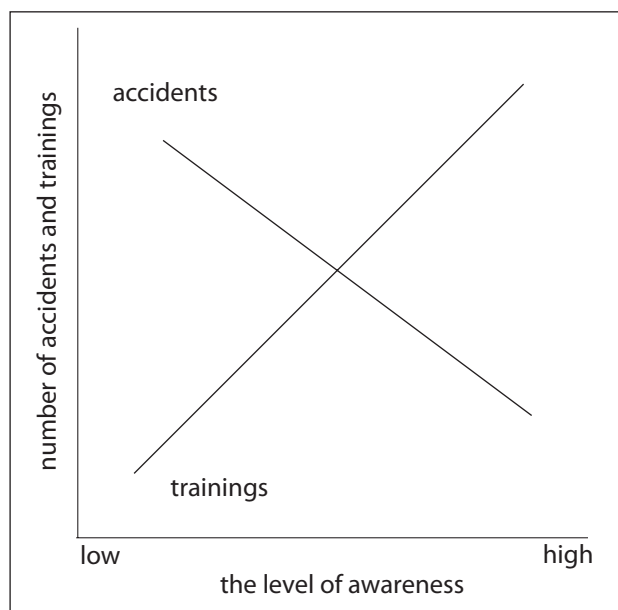
As it may be observed there is a rather close relationship between training and the accident rate (confirmation of the assumption stated in the theoretical part of this paper). The amount of accidents in total in ArcelorMittal Poland dropped significantly in recent years. In



**Figure 1** Number of accidents in ArcelorMittal after the initiation of the awareness management program



**Figure 2** Number of accidents in ArcelorMittal Poland before the initiation of the awareness management program [17]



**Figure 3** Dependence between training and accidents in work

2007 when the enterprise started to participate in the program of awareness management there were 79 accidents in total and it was 46 more than in 2011. In comparison, before the introduction of the program entitled “We raise our awareness in terms of work safety” the number of accidents was much higher (Figure 2).

In scientific approach there is a strong dependence between the process of building the awareness of safe work and the accident rate in the enterprise which can be presented in a graphic way (Figure 3).

The dependence presented in Figure 3 should be treated only theoretically and as an overview. This figure does not serve as the result of the co-relative calculations between training and accidents at work. The tests presented so far are limited only to a statement that such dependence exists. Moreover, not all components of employees' attitudes were presented; they were limited only to behavioural ones (resulting in a correct behaviour that is following the regulations of work safety). The remaining components of the attitudes, that is the component of valuation (conviction about the rightness of actions) and emotional component (the assessment of such actions) were not the subject of the analysis. It

should also be underlined that in the case study analysis not all internal risk sources in the process of building attitudes of safe work were taken into account. Nevertheless, it was assumed that employees' knowledge modelling is a significant paradigm of improving the system of safety and work hygiene management.

## CONCLUSION

By implementation of the awareness management program entitled *We raise our awareness in terms of work safety* a significant improvement of the work conditions was achieved in the analysed enterprise which also meant the decrease of the number of accidents at work. The effect of the trainings was the change of behaviour. However, it should be remembered that building workers' awareness is a long-term process and it should proceed slowly, but systematically. The key elements of building the awareness of workers are, among other aspects, the trainings.

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**Note:** The responsible translator for English language is D. Grachal, Katowice, Poland