Scientific Journals
of the Maritime University of Szczecin

Zeszyty Naukowe
Akademii Morskiej w Szczecinie

2015, 42 (114), 127–132
ISSN 1733-8670 (Printed)
ISSN 2392-0378 (Online)

Miscellaneous

The adaptation and in-service training system, for newly-hired employees, based on the example of a coal mine

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Key words: safety management, training, occupational adaptation, human factor, safety improvement, workers' skills

Abstract

This article presents the training system, adaptation and enhancement of skills by workers recruited for jobs in the coal mine. As mentioned in the introduction, a secure environment and safe behavior at work do not arise spontaneously, but must be developed according to a professional program. Therefore the enterprise studied here focused on improving safety, inter alia through the development and improvement of workers' skills, including advanced training and acquainting them with threats which can appear in their working environment. Research was performed in order to identify the most common problems in the field of training courses and professional adaptation in the coal mine. The research has shown which areas of OHS (Occupational Health and Safety) need to be corrected.

Introduction

The largest capital resource of every company is its employees. It is because of them that a company succeeds, but they can also be the cause of breakdowns, accidents and disasters. The purchase of modern and safe equipment, and low-risk technology implementation, are indispensable when it comes to reducing accidents and occupational diseases. Equally important, however, are well-chosen, well-trained and appropriately briefed staff (Gasparski, 2005; Gembalska-Kwiecień, 2013; Studenski, 1996).

Modern concepts of safety management recommend the use of technical, organizational and psychological preventive measures. Besides actual organizational and technical operations, it has become essential to provide people with the knowledge, experience and motivation to undertake safe behavior and avoid risk (Gembalska-Kwiecień, 2013; Lewandowski, 2000; Studenski, 1986).

The process of preparing employees to perform work safely is extremely important. Alongside selecting the appropriate individual for the work, occupational adaptation, motivation and stress reduction training are also key. However, many employers and employees do not realize that a secure environment and safe working behavior do not arise spontaneously, but need to be developed according to an approved program. It is necessary to undertake activities aimed at improving working conditions, equipment and employees' conduct across the enterprise (Gembalska-Kwiecień, 2012a; Petersen, 1988).

Despite a significant reduction in the number of injuries in recent years, ours is one of the countries with a high rate of accidents in the workplace. From the first to third quarter of the year 2014, 59,270 accidents at work were reported, including 176 deaths, and 357 major accidents. In the coal mining sector, over the same period of time, there have been 993 accidents in total, including 10 fatal and one major (GUS, 2014).

Those accidents, their consequences, and the poor state of the workers' health (as a result of working under adverse environmental conditions) are the cause of significant financial losses to the victims, their employers, and to society as a whole

(Gembalska-Kwiecień, 2014; Pawłowska, 1997; Studenski, 1986).

The question therefore arises – what action should be taken in order to effectively achieve the improvement of safety in mining enterprises? One possible solution is an adequate training system and the adaptation of workers recruited from companies in the field of safety management. This article focuses on the system of training, improvements and adaptation of a new employee working within the mine.

Selection for work and professional adaptation

Every employee should undergo a process of preparation to allow them to carry out their work safely. This process should include: the selection of the worker, professional adaptation, motivation, and stress reduction training.

The level of suitability for a particular job is a curvilinear function of qualifications and physical and intellectual might. Every job requires a certain balance of knowledge and efficiency – if it is too low in relation to the requirements of the task, the work is too difficult. Situations like this can lead to various mistakes, supply deficiencies, equipment damage or other accidents. If the level of skills and qualifications strongly exceeds the optimum level this is also undesirable, making the work too easy and monotonous. In such situations, workers do their jobs subconsciously, or take risks to increase the appeal of the tasks, which can also lead to accidents. For simple and easy tasks, choosing less skillful or efficient workers is better, while difficult tasks and jobs should be given to the most skilled and experienced workers. When work demands high requirements, it should be carried out through the selection of professional and specialized employees, or by searching for a gifted candidate with the expectation of receiving suitably high course results.

A person is suited to working on a specific workstation when they have the professional, physical and psychological qualifications for efficient and safe work. An employee's suitability for the work can be determined after hiring, based on results at work, but also before he is recruited, from pre-employment interviews, based on the prognosis of whether candidates appear suitable or not for working on a specific workstation (Petersen, 1988; Studenski, 1996).

Physical qualifications are based primarily on the physical predisposition of the candidate and on the evaluation of suitability for the particular job. Ascertaining psychological qualifications is in some work a formally and legally determined requirement for permission to work in a particular position. Psychological tests are often specifically designed to supplement the routine procedure of induction to work, which usually includes: verification of formal permissions, an analysis of any personal and biographical information, a review of health status, and an analysis of the rates of pay from previous places of employment.

A newly employed worker will not immediately be an independent and effective member of the crew. The first weeks or months are a period of time during which his working habits are shaped, including his attitude to the establishment, his superiors and the existing safety rules. Therefore, it should be noted that the period of adaptation is very important for the future progress and development of new employees.

The period of induction and adaptation should specifically be for:

- combating inappropriate habits or high-risk actions taken by new employees;
- acquiring the appropriate habits and attitudes preferred by the management of the new workplace;
- discovering that it is the duty of every employee to perform all professional activities bearing in mind their own safety of their own and the safety of others (Gembalska-Kwiecień, 2012b; Studenski, 1986);
- the process and results of the employee's adaptation depends on his reception by his supervisor and by the team. New employees usually attempt to prove that they deserve the hopes placed in them, and they want to work with team members to make a positive impression. They also follow their colleagues' example, and if they find that superiors and colleagues tolerate risk and work with disregard for health and safety provisions, the new employee will adopt their attitude. If the team which he joins carefully maintains OHS rules, then he will follow and practice these rules (Mendel, 2001; Studenski, 1986).

In order to prepare existing staff to welcome a new employee, management should:

- preemptively inform them about the induction of a new employee;
- inform the existing staff about the new employee, for example who is he, what his education is, and what can he do;
- convince the members of the team that their behavior will influence the future behavior of

a new employee, setting an example for him, especially in the principles of OHS;
- ensure that team members intervene when the new employee tries to act in a manner which is incompatible with the OHS provisions;
- introduce the new employee to individual team members.

Preparation of the worksite should involve creating an atmosphere of anticipation for a new employee. It is important that the new employee should be met by physical signs of expectation, for example in the form of free locker space, tools and protective equipment waiting for him etc. Preparation for a new employee should aim to give him information about the enterprise, the customs, the tasks awaiting him, an indication of the risks that may appear with his new tasks, the methods of reducing these risks and about the possibilities of professional progression at work.

An additional requirement for rapid and correct adaptation is the process of receiving feedback about the results of work and the progress made, as well as about any deficiencies and shortcomings, including anything that needs to be eliminated (Lewandowski, 2000; Studenski, 1996).

Professional adaptation process and enhancing worker's qualifications on the workstation in the mine

Professional adaptation of the workplace for a new employee is defined as:
- the necessary time to integrate with the mining company;
- the period of time needed for the employee's implementation of his professional activities at the workplace;
- the intentionally created favorable conditions, which enable new workers to obtain the required and expected outcomes of their work, whilst also ensuring the safety and health of working conditions.

The principles of the adaptation of the work are intended for all new employees in positions underground and on the higher levels of the mine. These principles define the process which help in the introduction of a new employee, and his safe work in the mine.

Professional adaptation of newly-hired workers, takes at least three months, counted from the date of initial training in the field of health and safety at work. It ends with an assessment of the process of adapting. If the employee does not get a positive result after this training, the period may be extended. The total period of the adaptation process may not exceed six months (Internal files of the coal mine).

Adaptation to the profession is divided into two stages:

Stage I – initial training of the OHS in the form of instruction, which includes:
- initial general training – "general instruction";
- initial training at the workplace – "workplace training".

Stage II – professional adaptation to the working environment.

Completion of the professional adaptation is carried out after a minimum of three months, counted from the date of initial training in the field of OHS. Professional adaptation concludes with the evaluation of the new employee's adaptation process in the working environment. The main purpose of the evaluation process of professional adaptation is to determine the worker's ability to reach the expected goals, and if these objectives are not achieved to identify the cause of this, and determine how the employee can be helped to resolve the situation. The final evaluation is carried out by the Examining Commission (Internal files of the coal mine).

In Figure 1, a professional adaptation process for a newly hired employee is presented.

Additional training courses allow the employee to perform his work more efficiently and competently, with more mechanized devices used in the work under the ground. It is important that those employed as blue-collar workers, have appropriate qualifications and a large resource of knowledge as it allows them to carry out their jobs safely.

One of the most important qualifying courses is a training course for the title of Professional Miner. The first condition for obtaining this title is the completion of the preparatory course for the title of Professional Underground Operator, which is designed to prepare participants for the qualifying exam (to become a Professional Underground Operator). The scope of the course contains news and skills appropriate to the qualifications for the profession.

The course is intended to prepare employees to gain the professional title of Professional Underground Operator and provide specialized training before they are allowed to work as a miner. This training contains the necessary information for safe and appropriate working. The course is based on a detailed teaching plan and the practical training is carried out by experienced miners with relevant experience. The theoretical training focuses on the rules and provisions of the mining regulations, aided by the use of examples of accidents that have

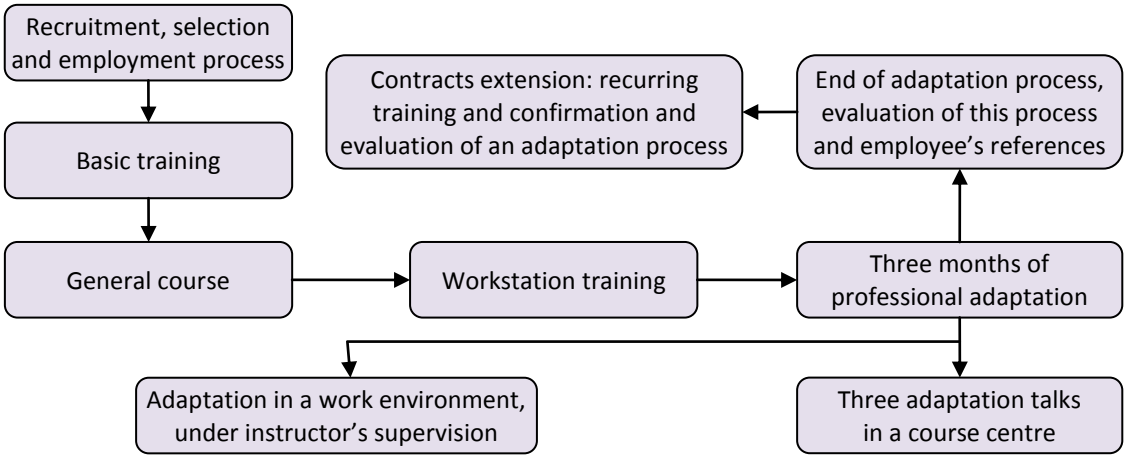

Figure. 1. Professional adaptation process (own study, based on internal files from the mine)

occurred in the mine. While discussing these cases, it is important to examine the causes and effects of accidents and how they can be prevented. The importance of awareness about the risks and proper implementation of the tasks connected with the workers' duties should be underlined.

After finishing the course with a positive result the employee may occupy the position of a miner in a mine. Every five years it is necessary for those employed as a miner to undertake a one-day specialized training course. It aims to remind, to supplement and update knowledge and skills, particularly in the area of the rules and principles of health and safety associated with their work, work-related risks and methods of protection against these threats.

One of the most demanding courses that a person employed as a miner can undertake is for the use of a long wall coal-cutting machine. The aim of the training is to prepare attendees for appropriate and safe work during the execution of activities as an operator of long wall coal-cutting machine. The training is carried out following a detailed program, which is based on material obtained from the current operators. The course ends with an exam led by the special commission, after which the worker is considered to be prepared to work as a long wall coal-cutting machine operator.

In the first five years of work, if the employee specializes on a particular branch, he can take a number of courses, which give him knowledge for safe and proper work at his workstation.

Research results

These empirical studies were performed to diagnose the main problems with training courses and professional adaptation in a coal mine. After completing the studies, the full results will be shown. The results will indicate if, and how, training courses and professional adaptation training has affected the OHS in the coal mine.

To obtain necessary information an anonymous questionnaire was used which contained 18 questions about the necessary knowledge for a newly-hired employee, including:

- basic rules of OHS;
- safety work methods on the workstation;
- knowledge about natural threats in the coal mine environment;
- principles of conduct in case of an accident;
- technical components of the workstation;
- principles of self-protection equipment distribution.

Employees were also asked about other aspects of training courses and the professional adaptation process in their company. The questions concerned topics such as:

- the need for periodic training in the field of OHS;
- the impact of this training on safety improvement;
- the reasons why knowledge obtained wasn't used in work;
- problems with professional adaptation.

The questionnaire was completed by 100 people; male labourers, engaged in physical work under the surface. They had an average age of 33 (Dokumenty wewnętrzne KWK). 87% of the questionnaires were able to be used.

The professional structure of the workers questioned has been presented in Table 1.

The most important research results are presented below.

- Studies carried out show gaps in workers' knowledge and capability of risk assessment

Table 1. Professional structure of questioned workers [own study based on internal files from the mine (Dokumenty wewnętrzne KWK)]

Job	Age	Amount	Education
Blasting miners	39–44	15	secondary education
Miners and younger miners	28–42	30	secondary education
Unqualified workers	21–25	20	primary education
Electricians	31–45	15	secondary education
Locksmiths and mechanics	32–44	10	secondary education
Machine service workers	38–45	10	secondary education

in their jobs. Only 42.13% of questioned employees had this knowledge. Because of this the coal mine should place emphasis on improving their safety training courses.

- 51.73% of interviewees feel safe, and believe there is no need for any innovations in this field, because in their opinion, the coal mine does a lot to improve the safety of work. 26.43% think that the working equipment shoud be replaced with new equipment, 21.84% of employees questioned has no opinion.
- For 57% of employees, the training courses which take place in their company, aren't interesting, necessary or even understandable. This shows huge passivity of the workers. It would be useful to know the reasons for this situation, and to boost workers' participation in the field of safety at work.
- 43% of interviewees claim that they always observe OHS rules, 37% say that they sometimes observe these rules, and 20% do it only when they have time for it. This shows that although there is awareness of the rules, work is also carried out in contravention to these rules.
- 73% of those questioned say that all employees affect safety in their company, but that they don't get involved in this process.
- For 89% of those interviewed, OHS rules protect their safety in work, and 72% of workers questioned feel responsible for their co-workers' safety.
- 86% of employees react to threats by informing their supervisor. 66% of employees claim they don't take risks while performing their jobs, and 59% of workers refuse to carry out their work when their workstation is not compatible with OHS rules.
- 47% of employees questioned think that the most common cause of accidents at work is workers behaving inappropriately.
- For 49% of interviewees, OHS training is necessary for safe work within the company, 64% claim that on the training courses, every accident is discussed, 37% say that the consequences of this accidents are also discussed. 18% say that workers' opinions are also discussed. This shows that accidents in work are comprehensively discussed, and everyone is able to pass their opinion.
- 37% of employees think that the professional adaptation process should be enriched by more safety courses.

Conclusions

"Safety in mining, through the decades, is one of the basic elements in the mines, as well as in technical workplaces" (Ćwięk, 2011). Many years of research and experience show that in underground mining it is impossible to eliminate accidents, because of the diversity of causes, mainly the natural conditions in which extraction must be carried out by a person.

This is why the process of professional adaptation and the appropriate system of training and courses, which improve workers' skills and affect work safety across the mining enterprise, are so important. As shown in this article, the system of training and courses, which improve the qualifications of workers in the coal mine, is widely deployed and highly diverse. Over five years of working, through mandatory training about health and safety at work and professional qualification raising courses, there is a significant increase in the level of knowledge and the awareness of employees about work safety in their specific working environment, as well as an understanding of how to prevent risks and avoid behaving in dangerous ways.

As the research results show, one of the biggest problems in relation to the safety of the working environment, is the workers' passivity. They are not interested in making their work safer, although it would be useful for them and the management. It is also necessary to boost workers' motivation for safe working by stimulating them into action. Proper professional adaptation would be very helpful in this process. Also eliminating workers who do not observe OHS rules, and who have a tendency for high-risk actions at work, is a necessary step on the path to greater safety at work.

Creating in a worker's mind the need for safe working is one of the most important tasks, as mentioned previously. It is also very important to make them understand how important enhancing

skills and professional training are when undertaking dangerous work in a coal mine.

References

1. Ćwięk, B. (2011) *Podstawowe zasady bezpiecznego zachowania w wyrobiskach górniczych*. Katowice: Wydawnictwo Górnicze Sp z o.o.
2. Dokumenty wewnętrzne KWK.
3. Gasparski, P. (1992) Kadra kierownicza wobec ryzyka zawodowego pracowników. In: *Psychologia i bezpieczeństwo pracy*. Warszawa: Wydawnictwo Instytut Psychologii, PAN.
4. Gembalska-Kwiecień, A. (2012a) Influence of employees attiudes and behaviour on safety culture in company. In: Biały, W. & Kaźmierczak, J. (eds.) *Systems Supporting Production Engineering. Monograph.* Gliwice: Wydawnictwo PKJS.
5. Gembalska-Kwiecień, A. (2012b) Szkolenia z bezpieczeństwa i higieny pracy w przedsiębiorstwie w ocenie pracowników. *Śląskie Wiadomości Elektryczne*. 6 (105). Katowice: Wydawnictwo Oddział Zagłębia Węglowego SEP.
6. Gembalska-Kwiecień, A. (2013) Prawidłowe kształtowanie środowiska pracy jako jeden z elementów podnoszenia bezpieczeństwa pracy. In: Biały, W. & Kaźmierczak, J. (eds.) *Systems Supporting Production Engineering. Monograph.* Gliwice: Wydawnictwo PKJS.
7. Gembalska-Kwiecień, A. (2014) Analiza funkcjonowania systemu zarządzania bezpieczeństwem pracy w górnictwie węgla kamiennego na przykładzie wybranej kopalni ze szczególnym uwzględnieniem partycypacji pracowników. In: Białek, J., Mielimąka, R. & Czerwińska-Lubszczyk, A. (eds.) *Górnictwo – perspektywy, zagrożenia. BHP oraz ochrona i rekultywacja powierzchni. Monografia.* Gliwice: Wydawnictwo P.A. Nova.
8. GUS (2014) *Główny Urząd Statystyczny. Monitorowanie rynku pracy*. Warszawa: Wydawnictwo Departament Demografii i Rynku Pracy.
9. Lewandowski, J. (2000) *Zarządzanie bezpieczeństwem pracy w przedsiębiorstwie*. Łódź : Wydawnictwo Politechniki Łódzkiej.
10. Mendel, T. (2001) *Partycypacja w zarządzaniu współczesnymi organizacjami*. Poznań : Wydawnictwo AE.
11. Pawłowska, Z. (1997) *Zarządzanie bezpieczeństwem i higieną pracy. Bezpieczeństwo pracy i ergonomia. Tom II*. Praca zbiorowa pod red. D. Koradeckiej. Warszawa: Wydawnictwo CIOP.
12. Petersen, D. (1988) Safety Management – A Humam Approach. New York : Wydawnictwo Aloray Inc.
13. Studenski, R. (1986) *Teorie przyczynowości wypadkowej i ich empiryczna weryfikacja*. Katowice: Wydawnictwo Główny Instytut Górnictwa.
14. Studenski, R. (1996) *Organizacja bezpiecznej pracy w przedsiębiorstwie Gliwice*: Wydawnictwo Politechniki Śląskiej.