The Impact of the Management System on Developing Occupational Safety Awareness Among Employees

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Abstract

This paper discusses the subject of occupational safety using the example of a leading hard coal mining company in Poland. It presents some examples of occupational safety management systems implemented and functioning in enterprises. It also characterises the role of awareness in developing the appropriate attitudes and conduct among employees in the workplace. The paper presents the selected results of surveys conducted among the executive employees of JSW S.A. The obtained results served as the basis for preparing preliminary conclusions and identifying potential areas for further studies in this field.

Keywords: *occupational safety, mining enterprise, management systems, employee awareness*

Introduction

Contemporary enterprises are interested in adopting consistent actions to improve the occupational safety of their employees. To this end, they implement health and safety management systems, and adopt innovative methods. The efficacy and effectiveness of these actions requires conducting them as part of a structured management system in place at these organisations. The OHS management system itself is also part of an enterprise or institution management system, the objective of which is to ensure the implementation of tasks connected with the management of occupational risk in the workplace environment [2]. The idea behind such a system involves the full involvement of the executives and each employee in activities aimed at occupational safety improvement [6]. The correct deployment of such a system is desirable both as a response to public expectations and as an opportunity to obtain positive company-wide and countrywide economic effects.

The concept of safety is not directly used in this paper, but it is difficult to discuss the risk or threats connected with performing a job without referring to this general concept. The employees' individual features, and especially their needs, may be a very important source of motivation promoting healthy and safe behaviour. According to the best-known classification of human needs by A.H. Maslow, they can be divided into basic needs and motivational needs. The most important basic needs are physiological needs, and safety needs are just behind them [3]. Psychologists understand safety more as a person's mental, emotional and material stability than as the lack of physical injuries and occupational diseases. This interpretation is closer to the understanding of safety in the context of performing professional work.

Poland's accession to the European Union has led to the publication of Polish ISO standards (18000) containing a definition of occupational health and safety, which is as follows: "The status of the work conditions and organisation and employee behaviour ensuring the required level of health and life protection against the threats present in the work environment" [10].

This paper contains a review of the occupational health and safety management systems implemented and operating at Polish mining enterprises. Anonymous surveys filled in by managers at one of the Polish coal mining enterprises were used for this purpose. Identifying weaknesses is a key element in implementing remedial action and improving safety [5]. This allows the process of continuous improvement, which is essential for the organisation's correct functioning, as it enables it to gain a competitive advantage [8].

The occupational health and safety management system in an enterprise

Enterprises which introduce occupational health and safety management systems (OHSMS) are looking to obtain measurable benefits connected with employee safety, as well as measurable economic benefits. The functioning of every occupational health and safety management system is based on legal documents, particularly the Constitution of the Republic of Poland and the Labour Code [13,14].One of the most important provisions of the Labour Code is Article 207, which clearly states that it is the Employer who "is responsible for the state of occupational health and safety in the workplace." This obliges the Employer to protect the health and life of employees by ensuring the safe and healthy conditions of work with appropriate use of scientific and technological achievements.

There are a number of safety management systems, and it is up to the enterprise's executives to make the decision about which system will be the best suited to a given company's capabilities and needs. Polish enterprises usually have systems in place based on the following standards:

- PN-N-18001:2004,
- OHSAS 18001:2007,
- ISRS: 2007,
- SCC,
- SEVESO II.

Tab. 1. Milestones in OHS management. Source: authors' work based on "Zarządzanie bezpieczeństwem pracy" (Occupational safety management) Karczewski, 2012 [7]

Tab. 1. Kamienie milowe w zarządzaniu BHP

Period	Event
Early 19th century	Recognising accidents
1930s	Personal protective equipment and covers
1940s÷50s	Ergonomics
1960s	Technical safety
1970s	Risk analysis – the human factor
1980s	Organisation and safety
1990s	Occupational safety management systems
21st century	A culture of occupational safety

The choice and implementation of the OHS management system is often connected with the size and economic capabilities of the enterprise. Safety Health Environment Checklist Contractors (SCC) systems are meant for small companies and are developed on the basis of formulated mandatory and additional questions. For large enterprises, it is much more common to use extended OHS management systems, i.e. PN-N-18001 or ISRS, which distinguish several monitoring and audit areas. Additional systems are often integrated with other systems functioning in enterprises, such as:

- ISO 9001 – requirements for the quality management system,
- ISO 14001 – requirements for environmental management,
- ISO 22000 – requirements for the food safety management system,
- ISO 27001 – requirements for information security management,
- ISO 50001 – requirements for energy management.

The benefits from implementing an OHS management system in an enterprise include primarily:

- reducing the level of occupational risk,
- regulating the formal and legal status,
- increasing the personnel's awareness of the nature of OHS issues,
- an actual improvement in the working conditions,
- quick detection and elimination of potential non-compliances by prevention, not correction,
- a smaller number of employees exposed to harmful factors as a result of identifying threats and implementing specific actions,
- reducing the number of accidents (supervision over near misses),
- a lower number of employees suffering from occupational diseases,
- reducing the number of sick leaves,
- boosting the company's credibility,
- building the company's image as a Safe Enterprise,
- meeting the expectations of employees and customers,
- improving work efficiency,
- improving the relationship between the employer and supervisory bodies in the field of working conditions.

Running an enterprise under the conditions of a free market and competition requires the introduction of innovative management methods to facilitate better functioning in a changing environment. Effective tools assisting the activities of an enterprise include occupational safety management systems based on Polish and international standards. Occupational safety management has a relatively short history, as it dates back to the 1990s. It is assumed that the first comprehensive occupational safety management system based on occupational risk assessment was created by W.G. Johnson. In his book, MORT Safety Assurance Systems, he described a concept of formal risk acceptance by a company's management, acceptable risk and the reason for an accident as a consequence of the adopted risk level [4]. The MORT system introduced in the U.S. energy sector largely contributed to the appreciation of a safety management system consisting of the product of the probability of an incident and the extent of the related result. Replacing danger with risk was a milestone in the progress towards rationalising occupational safety management. Through this, occupational safety management has become an integral part of managing an enterprise, which is profitable in terms of improving economic status. Table 1 presents the decades and events that marked the milestones in the development of occupational safety.

It should also be noted that the concept of the occupational safety management systems being developed differed between Europe and overseas countries (USA, Japan). In Europe, safe work was largely understood as aspects aimed at preventing threats to employees or people present in the workplace (enterprise). By comparison, in the USA the concept of occupational safety was extended to include issues connected with protecting the company's property, production and service safety, and safe products. Such a different approach to occupational safety management is a factor that determines effectiveness and profitability. It can be stated that the more extensive the risk assessment and analysis, the greater the chance to develop an effective occupational safety management system. Furthermore, emphasising the significance of the human factor is currently an important element of the culture of occupational safety. The level of safety in an enterprise is shaped by the daily behaviour of all employees, which results from their beliefs and values. For this reason, many contemporary companies implement employee conduct improvement programmes as some of the most important elements of their occupational safety management
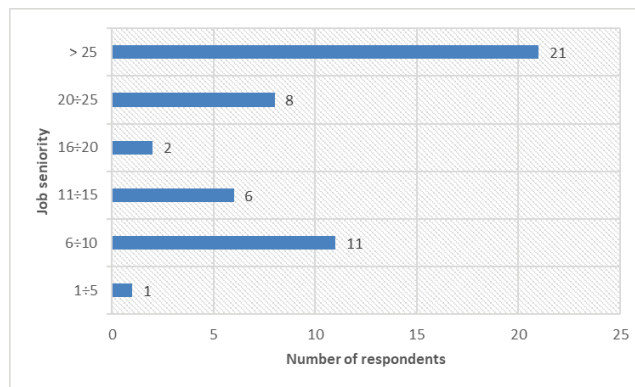
Fig. 1 The job seniorities of employees covered by the survey. Source: prepared by the author, 2019
Rys. 1. Staż pracy pracowników objętych ankietą

systems [1]. The requirement to have such a programme in place is mandatory under the SCC.

Employee awareness in developing safe attitudes and conduct

Awareness, or consciousness, is a vast concept used within many social sciences. These include philosophy, psychology, sociology, history, law and education studies. Philosophy and psychology provide us with the most complete knowledge about awareness. In philosophy, being aware initially referred to the sense of experiencing the world, directly feeling something, feeling present within the inner perception – the area of consciousness. Psychology offers a similar definition, describing it as being conscious, awake or able to receive environmental stimuli. In a narrower, stricter and more human-specific sense , it is the highest level of mental development in which it is important to be aware of your own representation of reality and your activity within it. The representation of reality depends on the structure and functioning of the senses through which the human being receives information about what is going on in the external world, and within himself or herself, and on the structure and operation of the brain, which applies complex analysis and synthesis processes to the data received by the senses. In education studies, awareness means:

- the ability to perceive one's own conduct, its circumstances and consequences, which is characteristic of human beings,
- the human psyche, as a specific function of the central nervous system and the highest form of regulating the behaviour of humans, setting them apart from animals,
- the processes of receiving information and controlling human behaviour,
- the state of being aware, or conscious, in contrast to dreaming or loss of consciousness; psychoanalysis also distinguishes between the unconscious and the subconscious, and the ability to experience emotional states, i.e. the self.

Employee awareness in terms of occupational safety has an impact on the way of thinking and working of employees in a working environment [11]. The principal role in shaping awareness is played by all kinds of educational activities, starting from knowledge obtained at school, through workplace

training and all forms of media education (television, radio, press), to promotional projects [9]. By developing awareness combined with appropriate knowledge, we prepare employees to behave and act in a desirable way. These actions will be effective if we achieve a state in which the employee is aware of the purpose and meaning of his or her actions, and the potential consequences for the public. Legal regulations oblige supervisory bodies and employers to provide occupational health and safety training to their personnel [13]. An organisation should adopt and maintain specific procedures to make its employees aware of:

- the types of threats present across the organisation and at individual workstations, and the occupational risk associated with them,
- the benefits for employees and organisations from eliminating hazards and reducing occupational risk,
- their tasks and responsibility in making their actions compliant with the occupational health and safety management policy, and the procedures and requirements of the occupational health and safety management system, along with the requirements concerning readiness for and responding to accidents and major accidents at work,
- the potential consequences of non-compliance with the specified procedures.

Actively engaging employees in occupational health and safety management processes facilitates achieving both general and specific objectives [12].

Surveys among JSW S.A.'s executive employees

An important element in an implemented occupational safety management system is the knowledge and awareness of the enterprise's employees. A survey was conducted in November 2018 to obtain answers to the question regarding the awareness of JSW S.A.'s executive employees and their impact on improving OHS conditions. The questions were formulated in such a way to obtain information on a wide range of subjects within occupational safety. Furthermore, the survey part was supplemented with information obtained during conversations and face-to-face interviews with the respondents. Closed-ended questions with yes/no answers or grade scales from 1 to 5 could be supplemented with comments and opinions. This survey methodology affords a higher precision in identifying
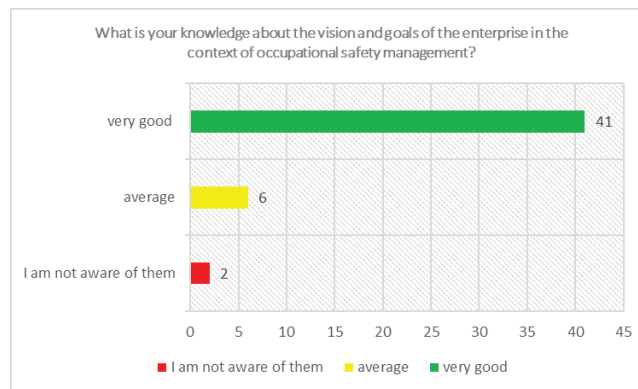
Fig. 2 The enterprise's vision and goals. Source: prepared by the author, 2019
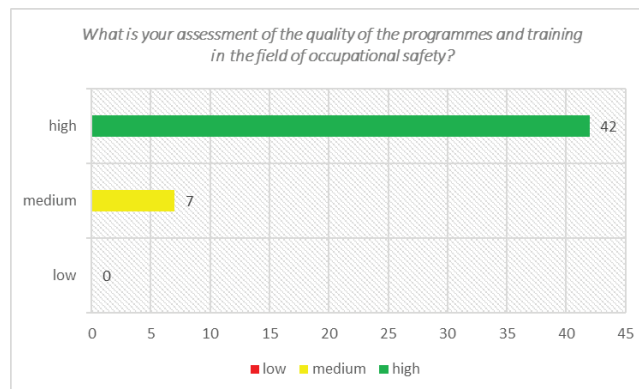Rys. 2. Wizja i cele przedsiębiorstwa

Fig. 3 Programme and training quality. Source: prepared by the author, 2019
Rys. 3. Jakość programu i szkoleni

hazards by taking into account the remarks and comments of the respondents. The first part of the survey concerned the age and job seniority of the respondents. The survey was conducted during post-graduate classes for JSW S.A.'s executive employees and involved 49 respondents. Fig. 1 presents the job seniorities of employees who took part in the survey.

Fig. 1 shows that 29 executive employees, representing 60% of the surveyed sample, have a job seniority of over 20 years. The respondents clearly have a long-standing work experience and can objectively assess the enterprises activities in terms of developing an occupational safety policy. Furthermore, the mean respondent age was approximately 44 years.

Figs. 2÷6 show the responses to selected questionnaire questions. Using the 1÷5 grade scale was meant to elicit more accurate answers to individual questions. However, certain assumptions were adopted to facilitate further analysis. Values 4÷5 were considered positive and 1÷2 were seen as negative. Answers with a value of 3 were classified as neutral.

The answers provided by executive employees demonstrate that a majority assign relatively high scores to the activities conducted by the enterprise in terms of improving OHS conditions. Particularly high scores were provided for the vision and objectives set by the company, and the programmes and quality of occupational safety training. 41 and 42 respondents gave positive answers, respectively, which accounted for 84% and 86% of the surveyed employees. Only two respondents declared that they did not know the objective and vision of the enterprise's occupational safety policy. An important management area is the full involvement of executive employees in activities promoting safe conduct among employees. Two respondents from the analysed sample said that the managers were not engaged in any activities and 38 respondents said that they were fully engaged.

The most important element in an occupational safety system is the compliance of employees with the OHS regulations. The question: "What is your assessment of OHS compliance by employees at workstations" yielded positive answers from only 24 respondents, which accounted for 49% of the surveyed population. At the same time, as many as 29% of the respondents gave a negative response, and the remaining 22% did not provide a clear answer. This area is essential for any occupational safety system in an enterprise. Identifying the system's weaknesses makes it possible to introduce comprehensive solutions and a restructuring plan. One method involves further certification and refinement of safety procedures. The respondents are aware that the company updates and implements new procedures in the field of accident prevention and working conditions improvement. Nearly 84% of the executive employees surveyed were aware of the implemented and functioning safety certificates at their enterprise.

Conclusions

Implementing an occupational health and safety management system in an enterprise may bring both tangible and intangible benefits to the organisation. Without question, the presence of a management system should improve the company's reputation on the market and in relation to its stake-
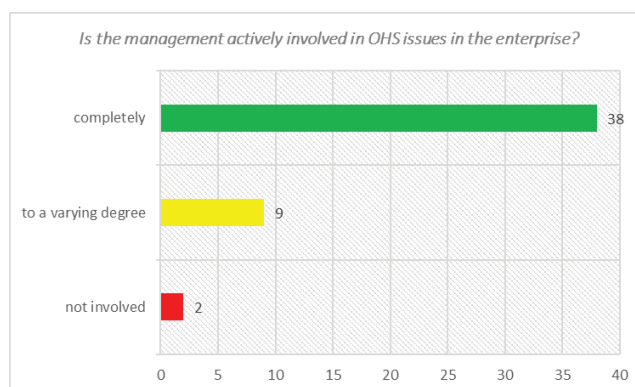
Fig. 4 The management's involvement in occupational safety. Source: prepared by the author, 2019
Rys. 4. Struktura zatrudniania wg płci i wieku w GK LW Bogdanka SA. Źródło: opracowanie własne na podstawie [23]
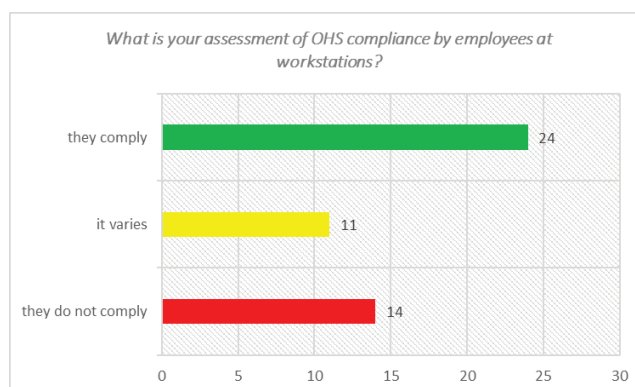

Fig. 5 Employee compliance with regulations. Source: prepared by the author, 2019
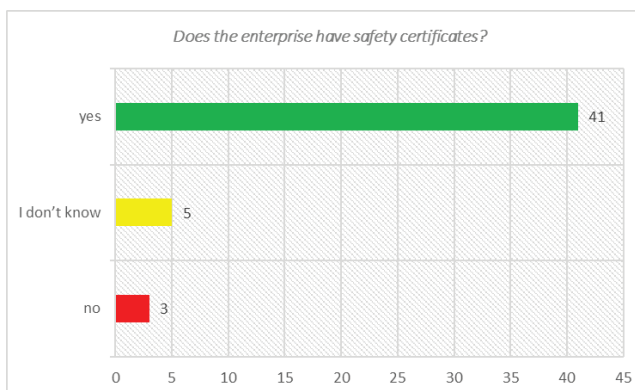Rys. 4. Struktura zatrudniania wg płci i wieku w GK LW Bogdanka SA. Źródło: opracowanie własne na podstawie [23]

Fig. 6 Safety certificates in an enterprise. Source: prepared by the author, 2019
Rys. 4. Struktura zatrudniania wg płci i wieku w GK LW Bogdanka SA. Źródło: opracowanie własne na podstawie [23]

holders, such as customers, subcontractors, the local community and state authorities supervising working conditions. The increased awareness and gained experience among employees may be used in other fields of enterprise management, such as finance and human resources. By developing awareness and providing appropriate knowledge, we prepare employees to behave and act in a desirable way. These actions will be effective if we achieve a state in which the employee is aware of the purpose and meaning of his or her actions, and the potential consequences for the public.

The survey demonstrates that there is still room for improvement in terms of improving the OHS conditions by enterprises. Achieving a high level of occupational safety requires the activity and effort of executives, but also the full involvement and participation of regular employees. The survey, which was conducted in November 2019, involved 49 executive employees of JSW S.A. The surveyed individuals assigned high scores to the preventive actions conducted by the employer in terms of developing safe working conditions. However, they are aware that the weak link in the system is employee compliance. The identification of strengths and weaknesses allows defining the directions of action, which should significantly improve occupational safety.

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Wpływ systemu zarządzania na kształtowanie świadomości pracownika
w zakresie bezpieczeństwa pracy

Artkuł przedstawia problematykę dotyczącą bezpieczeństwa pracy na przykładzie wiodącej spółki wydobywającej węgiel kamienny w Polsce. Przedstawiono przykłady wdrożonych i funkcjonujących systemów zarządzania bezpieczeństwem pracy w przedsiębiorstwach. Ponadto scharakteryzowano rolę świadomości w kształtowaniu właściwych postaw i zachowań pracowników w miejscu pracy. W formie graficznej zaprezentowano wybrane wyniki z ankiet przeprowadzonych wśród pracowników zatrudnionych na stanowiskach kierowniczych JSW S.A. Na podstawie otrzymanych wyników sformułowano wstępne wnioski oraz kierunki dalszych badań w prezentowanym obszarze.

Słowa kluczowe: bezpieczeństwo pracy, przedsiębiorstwo górnicze, systemy zarządzania, świadomość pracownika