

The concept of occupational safety lists – documented information solution of OSH risks at work activities

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Abstract: - The basis of OSH system is the handover of suitable and complete information regarding safety aspects of performed working procedure. Occupational safety is an inseparable part of any work activity and the emphasis on safety aspects should be a common part of handed information. It is up to the supervisor which way of information handover will they choose. It is also their responsibility to have the information complex and decide if the information will be presented to the employee at the performed work. The problem should arise when critical issues are not well articulated and should bring misunderstanding on both sides. One of the main solutions in this area are working procedures which are clear for all workers that are involved within the process in the company. The main objective of this article is to show up one of the possibilities which are used here and can improve this problem. We used scientific methods like analyzing, comparison, deduction and synthesis to find out relevant outcomes of an article and from the specific methods Safety review and Checklist analysis was used. The supervisor can be helped with the form and the complex handover of the information by having a uniform format of the documented information available – occupational safety list.

Key-Words: - OSH, occupational injuries, safety list concept, occupational safety, working environment, hazards.

1 Introduction

All employers deal with essential specific OSH requirements within their operational activities. The requirements arise from both legal regulations and technical norms. There were times when the technical point of view was the basis for dealing with OHS rules. The approach then was similar at various employers - technical equipment operators. The transition to systemic approach brought into consideration local specifics reflecting the

workplace and working place characteristics and operational methods, abilities and skills of individual workers and overall employer's OSH culture level. Moreover, the transition to systemic approach expanded from any technical equipment to any work activity. This resulted in broader solution variability regarding general requirements from both solution and documentation point of view. Mentioned variability and the OSH level of understanding were then affected the documented information creation presented to employees.

Despite the fact that employers specify general legislative requirements for their workplaces to ensure OSH by themselves there are some uniting elements that allow uniform concept to fulfil general requirements. A concept that can offer a framework for general requirements fulfilment as well as serve as a content guideline for created documented information about risks at specific work activities. In text bellow authors will discuss the OHS requirements and expenses that are spent to minimize risks. Therefore it is necessary to analyze work accidents in Czech republic and EU to find out frequencies of injuries in different countries. Methodology and solution within the topic is figured out later on. The main part of this article is t Occupational lists types' as a proposal for solving identified problem.

2 Working conditions' improvement

The employers deal with defining safe working procedures to ensure repeated production of their articles in required quality. The OSH requirements are an inseparable part of production and they cannot be viewed as an obstacle of performed work activity. The obstacle is rather the false viewing of work accident as a result of human error which is presented as an unpredictable outcome of hidden mental processes [10]. The OSH requirements are involved in securing article's qualitative characteristics (e.g. by defining the purity of working environment) but they mainly protect the employers (e.g. from minor injury) from long-term negative impacts on health and from occupational injuries (e.g. vibration protection, ergonomic health problems induced by non-ergonomically arranged workspace etc.) An employee is most valuable to an employer, and an aware employer knows that. An employee is a bearer of knowledge and skills. There were surely certain resources put into the employee's initial training. New employee must have been trained for given position which in some cases can take up to several months until the new employee reaches full self-reliance. Employee's absence as a result of occupational injury is a significant loss for an employer since it causes production to stop in order to investigate the circumstances leading to the injury as well as direct (e.g. sick pay, disability benefits etc.) and indirect (e.g. recruitment expenses, temporary exchange of employees, decreased productivity expenses) expenses. Even a temporary absence of an employee causes a loss since the situation requires extra expanses to train a spare employee who can have lower performance. This situation is followed by the

need for more frequent checks of spare worker's performance which can occupy another employee and take the focus off from their own occupational activities.

No matter how the expenses seem to be easy to calculate there is no existing statistics within European Union that would give credible evidence on such expenses. Based on the Analysis of European data sources there is not enough relevant information available in the industrial accidents reports [5] [9]. If we take a closer look at the accident incident rate statistics in Czech Republic an average length of one occupational injury with subsequent incapacity for work has been a little less than 8 calendar weeks for about 10 years now [1] – see figure no. 1. However, the number of occupational injuries itself is decreasing.

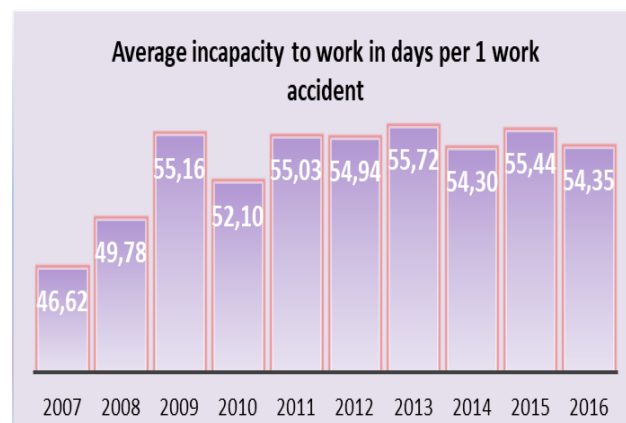


Figure 1 Average incapacity to work in days per 1 work accident
source: VÚBP - Labor Accident in the Czech Republic in 2016

Figure no. 2 shows the changes of occupational injuries' frequency in Czech Republic with subsequent incapacity for work over 3 days. There is an ongoing decreasing trend in number of occupational injuries. Having compared this to the number of days on sick leave caused by work accident it can be noticed that the figure indicating the length of treatment of one occupational injury is entirely independent of the number of the injuries alone since meanwhile the average length of treatment is getting longer the total number of occupational injuries is decreasing. This is caused by the fact that while the decreasing frequency of occupational injuries provides a certain image of improved quality in OSH management, the increasing number of days spent on sick leave, on the other hand, mirrors the level of general care and approach to injured employees.



Figure 2 Number of work-related accidents with incapacity for work over 3 days
source: VÚBP - Labor Accident in the Czech Republic in 2016

Another chapter constitutes of accidental deaths. In Czech Republic there is 1 fatal injury per 100,000 inhabitants. Figure no. 3 shows percentage of accidental deaths from the total number of work accidents.

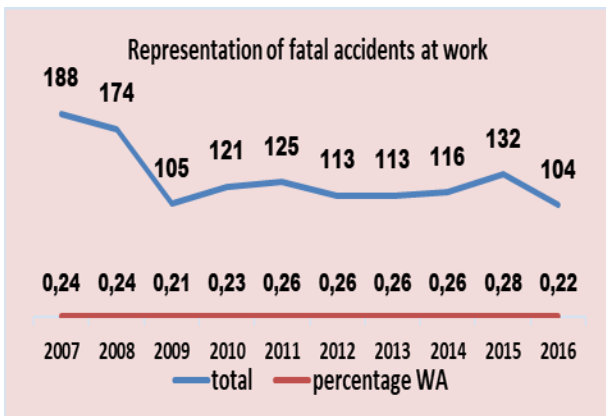


Figure 3 Representation of fatal accidents at work
source: VÚBP - Labor Accident in the Czech Republic in 2016

The occupational injury prevention therefore becomes an employer’s fundamental problem. Eurostat data shows that 29.9% of employees leave their job due to medical reasons [12]. In Czech Republic the losses due to work accidents and occupational diseases are annually calculated in the range of 20 – 30 billion Czech crowns [7, 11] (approx. 781 – 1172 billion €), which makes the loss of 444 – 666 thousand Czech crowns (approx. 17 – 26 thousand €) per injury. Despite the fact that the number of injuries, including accidental deaths, in Czech Republic is relatively low and compared to

other states of the world the EU performs quite well – see chart no. 4, still the European expenses per injury are 476 billion € which is on the 3.3% level of European GDP [4].

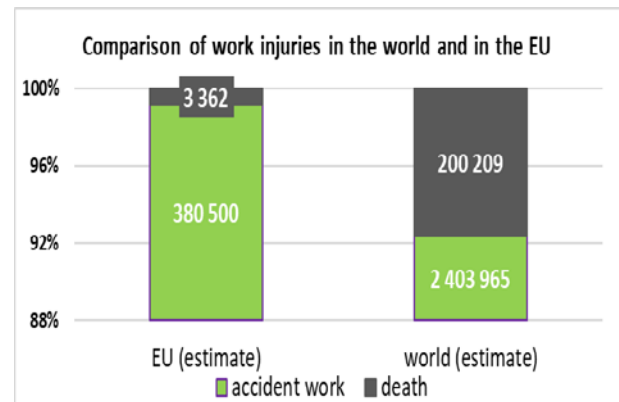


Figure 4 Comparison of work injuries in the world and in the EU

Source: EU-OSHA - International comparison of the cost of accidents at work and occupational diseases

The expenses on health damage leading to occupational disease are similar, yet the loss of an employee is permanent. It is necessary to face the fact that the concept of occupational disease depends on domestic legal regulations and compensatory practice [5], which is one of the factors preventing any comparison of statistical data. It is also important to bear in mind that employer’s expenses on an employee who is suffering from occupational disease differ in different countries according to effective national legislation and with the involvement of insurance companies into occupational health protection system. Nevertheless, it is the involvement of insurance companies or national benefits into the occupational health protection system that creates efficient scope for financial support and projects that aim to improve employee’s working conditions. Economic incentives in OSH area are considered to be an efficient tool for accident reduction and safety culture improvement, which has been proven by tracked case studies [2]:

- Since the implementation of investive programme in Germany in 2001 the involved meat manufacturing industry factories detected over 25% reduction of occupational injuries subjected to reporting; within Finnish agriculture the accident rate decreased by more than 10%.
- There were less work accidents and lower insurance rate detected in 70% of Polish factories which had implemented financial based Safety Management System, while 50% of these factories reported less workers working in unsafe conditions.

- An Italian bureau responsible for employee's compensation subsidizes bank loans to boost investments into OSH in small and middle-sized companies. Involved companies reported 13-25% less injuries compared to other companies.

- Having implemented modern health protection management system in German companies, German health insurance incentive programme contributed to major decrease of sick payments and incapacity for work.

- Dutch investments grant programme into new safer mechanical equipment resulted in working conditions improvement in 76% of the companies (40% of the employers reported the new equipment to be very beneficial, 36% reported it beneficial).

There are taxes reliefs related to OSH in Latvia (tax reliefs in the protective equipment area) and in Germany (tax amortisation). In Holland companies were rewarded through grants [3].

Besides these efficient benefits that are also aimed on small and middle-sized companies, a category which in Czech Republic makes 99.8% of the total number of active business subjects [8], i.e. approx. 1.14 million of legal or natural persons – 1.9 million of self-employed people can be added to this number [6], it is right to help these small employers with practical application of OSH requirements. It can be said that large-sized and supranational businesses have quite a high level of OSH culture, in many ways they determine the course of OSH, ergonomics and health protection. Yet it cannot be overlooked that overwhelming majority of employees work in small and medium-sized businesses which usually do not have the resources of large-sized businesses and not even such a general and OHS knowledge. This can be caused simply by operational blindness in economic interests monitoring in order to survive in the market. Such blindness is followed by certain level of inconsistency in the OSS area. To eliminate such unintentional inconsistency it would suffice to accept and apply uniform safety lists concept of documented information on working risks and protection adoption including safe work organization.

3 Problem Solution

As it was mentioned, the OSH organization in workplaces fully emerges from employer's efforts. Legal or technological regulations introduce requirements that have to be fulfilled in order to protect health. The employer decides about the execution. The level of implemented OSH mirrors

not only employer's possibilities and abilities but also general awareness of OSH rules and overall company culture.

One of the key principles in industrial safety is the information handover to employees, especially factual and properly structured information allowing better and quicker orientation. These are information on possible dangers in working environment or dangers that can occur during occupational activities and hazards that can emerge from such activities that can affect employee's health.

3.1 Methodology

The key element of risk prevention is to ensure high-quality and properly structured information handover to employees. One of the possible ways how to help improve the perception of danger in workplaces and occupational hazard and how to decrease possible accidents and occupational safety improvement is an implementation of uniform approach of written information handover – working procedures – to employees. Such approach would be based on uniform format of handed information which would be beneficial especially to employees when changing workplaces or employers.

Solution proposal is based on business' operational experience where some of the elements can be already identified, e.g. in variety of written rules for manipulation with certain chemical substances and chemical agents or illustrative representations presented in specialized sources [13].

3.2 Solution

Written work instructions created by employer can have a uniform format to which each employer can project their own specifics. The format uniformity can be understood as:

- 1) occupational lists types' definition
- 2) uniform design
- 3) the use of traffic-light colours
- 4) the use of visualization elements
- 5) uniform content structure.

3.2.1 Occupational lists types' definition

Occupational lists types' definition serves to specify the part of OSH requirements that are possible and

suitable to resolve with this concept. Among the suitable instructions presented in this way are:

- general safety instructions
- work instructions (technical equipment operator, technological or work procedure)
- safe handling principles (with dangerous material or chemical substance)

3.2.2 Uniform design

The concept of occupational safety lists is based on basic ideas:

- brevity
- clear arrangement
- comprehensibility
- safety visualization (use of symbols and pictograms)

The basic requirement is creation of working instruction in one page A4 format. There should be all necessary instructions given on this A4 format. No matter how obvious it is that not all instructions can fit fixed format, multiplication of the pages could be perceived as contra productive and less acceptable by the employees.

Therefore, it is necessary to provide required information in the briefest form while preserving its comprehensibility and its informational value. The clear arrangement of provided information is achieved by structuring the occupational list into logical sections – see uniform content structure.

Moreover, the list has to signal to the employee at first sight the safety-related character of the handed information – see list colour solution. The list should also clearly show taken crucial safety measures - see visualization elements.

3.2.3 Safety list colour solution

List colour solution consists of occupational safety list content coloured framing. Occupational safety lists should be prepared, based on its safety character value, in following colours:

- white (green) to show general information (e.g. safety duties regarding machine operation or workplace behaviour)

- green for absolutely safe working procedures (e.g. safe operation of dangerous technical equipment)
- yellow for unsafe working procedures (require permanent protection from serious health damages)
- red for hazardous working procedures (e.g. presence of flammable gases, steams, fogs or dust; manipulation with highly toxic, carcinogenic or mutagenic flammable substances).

3.2.4 Visualization elements

Individual information should be supported with established pictograms to allow quicker orientation in text or simply quicker perception of instruction without reading. For example, if it is determined in the text that it is necessary to use protective coat, protective gloves and protective glasses the relevant section of the list can be enhanced with pictograms of a coat, gloves and glasses (danger symbols), a picture of actual type of (personal) protective equipment or a properly dressed employee.

2.2.5 Uniform content structure

The occupational safety list uniform content structure corresponds the type of occupational safety list. The basis of safety information for employee should be:

- the hazards for an employee and working environment with defined protective measures and rules of conduct,
- instructions for conduct in emergency situations,
- instructions for providing first-aid.

There is a visualized concept of a list for dangerous work performance in figure no. 5.








logo firmy		Název zařízení / postupu	provazovna - místo pracoviště - označení verze - označení			
BEZPEČNOSTNÍ PRACOVNÍ POSTUPY						
Rizika pro pracovníka a pracovní prostředí						
Nebezpečí poškození oděvu při odkládání materiálů.		     				
Nebezpečí poškození dýchacích cest prachem manipulovaného materiálu.						
Možnost alergické kožní reakce vlivem působení přítulného prachu zpracovávaného materiálu.						
Nebezpečí poranění zad a končetin při neopatrné manipulaci s manipulačními jednotkami (břemeny).						
Nebezpečí přirážení, naražení, naježdění při manipulaci s paletovým vozíkem.						
Nebezpečí pádu na rovném, na schodech.						
Nebezpečí vzniku výbušné koncentrace prachu při manipulaci s některými materiály.						
Ochranná opatření a pravidla chování						
PŘED SPUŠTENÍM PROVOZU						
Vizuální kontrola úplnosti technických a bezpečnostních prvků, čistoty pracoviště, funkčnosti odsávání.						
Příprava požadovaných surovin, materiálů a pomůcek podle druhu a množství výroby.						
Pro obsluhu zařízení postačuje jeden pracovník; s nadměrnými břemeny nakládat ve dvou.						
PO SPUŠTENÍ PROVOZU						
Vysypávat požadované suroviny do násypku - neodstraňovat rosti						
Prázdné obaly odkládat na určené místo.						
Udržovat čistotu pracoviště a jeho okolí (uzavazovaný prach).						
Kontrolovat technický stav zařízení, hlavně rostu a činnosti odsávání.						
PO UKONČENÍ PROVOZU						
Čištění zařízení a okolí zařízení od nečistot (prachu) - prach nezarmat, nevířít, ale odvádět						
Kontrola prvků zařízení (celistvost, neporušenost, ...)						
BEZPEČNOSTNÍ POKYNY						
V průběhu odfukování nesmí být otvor násypky nezakrytý mřížkou.						
Při práci dodržovat zásady bezpečné manipulace s břemeny a hmotnostní limity.						
Používat vhodné OHP - ochrana rukou, dýchací, oči.						
Po práci si umýt ruce a ošetřit vhodným krémem.						
Dodržujte pravidla práce osamocněného pracovníka na pracovišti (průběžné hlášení, namátková kontrola).						
Užijte ochranu kůže pracovním oděvem a obuví.						
Užijte prachovou masku typu filtru P2.						
Užijte ochranu očí uzavřenými ochrannými brýlemi Protli .						
Doporučená ochrana rukou: MaxiFlex , nitril.						
Po ukončení činnosti, před konzumací potravin, proveďte omytí rukou mýdlem, ošetřete je ochranným krémem.						
CHOVÁNÍ V NOUZOÝCH SITUACÍCH						
HASÍCI PROSTŘEDKY						
VHODNÉ:						
<table border="1"> <tr> <td>Okamžitě zastavit chod zařízení při výskytu poruchy chodu zařízení či nebezpečných událostí a ihned ohlásit vedoucímu pracovníkovi</td> </tr> <tr> <td>prášek</td> </tr> <tr> <td>CO₂</td> </tr> <tr> <td>Neodstraňovat poruchu bez patřičného kvalifikačního oprávnění</td> </tr> <tr> <td>Ridit se pokyny vedoucího či pokyny pracovníků údržby</td> </tr> </table>				Okamžitě zastavit chod zařízení při výskytu poruchy chodu zařízení či nebezpečných událostí a ihned ohlásit vedoucímu pracovníkovi	prášek	CO ₂
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prášek						
CO ₂						
Neodstraňovat poruchu bez patřičného kvalifikačního oprávnění						
Ridit se pokyny vedoucího či pokyny pracovníků údržby						
NEVHODNÉ:						
<table border="1"> <tr> <td>V případě požáru vypnout zařízení a pokusit se požár zlikvidovat nebo vyhlásit požární poplach a zahájit evakuaci pracoviště.</td> </tr> <tr> <td>voda</td> </tr> </table>		V případě požáru vypnout zařízení a pokusit se požár zlikvidovat nebo vyhlásit požární poplach a zahájit evakuaci pracoviště.	voda			
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voda						
POKYNY PRO PRVNÍ PŘEDLEKARSKOU POMOČ						
Zachovejte klid, dbejte o vlastní bezpečnost, vyžádejte si pomoc ostatních pracovníků						
Vывeďte postiženého mimo nebezpečnou oblast či na čerstvý vzduch, podějte teply nápoj (je-li to vhodné).						
Nejprve zajištěte životní funkce (resuscitace), při popáleninách nestrhávejte oděv (jen stěrné překrytje), pak zastavte velká krvácení, nakonec ošetřete drobná poranění.						
Vždy přivolte lékařskou pomoc (tísňová linka 155).						
zpracoval: jméno		datum zpracování / aktualizace				
		schválil: jméno				

Figure 5 Illustration of the security work card

4 Conclusion

The OSH performs on quite a high-level in the EU countries and has a rich tradition in the individual member states. Individual indicators are showing that the care for healthy working environment and safe working procedures is, in overall numbers, tended on an appropriate level. Nevertheless, the application space has to solve not only the well known hazards, but mainly new aspects as they occur with changing work technology and technical development. Already existing solutions are appropriately used, although there is nothing preventing them from being enhanced with new approaches which would help improve working conditions, and with that, influence the negative effects on employees.

Documented information on occupational hazards is a common and standard part of employer's documentation and can be encountered in majority of workplaces or as a part of repeatable process documentation. Such documented information are of a different informative value, different arrangements and often reflect the OSH culture of a given employer.

Occupational safety list proposal introduced above differs from these documents only by uniting the content of documented information with an aim to help maintain the complexity of handed safety information and emphasizing occupational hazards together with suitable measures adoption in order to reduce such hazards and therefore prevent health damage. Since it is assumed that the lists will be placed noticeably in a relevant workplace, the visualization element is strongly accentuated by the usage of colours, which help to distinguish the importance of handed information at first sight, as well as the usage of symbols.

The occupational safety lists would pose as a suitable tool for timely hazard factor identification for employees in new workplaces, within occupational activities that are not performed on daily basis, for employees that are coming at new employers' workplaces or at different employers' workplaces. Prompt and clearly arranged information about dangers and hazards, information on appropriate protection and on required activity is the basis of accident rate prevention, required quality of work maintenance and its output, as well as whole operation efficiency. The use of traffic-light colours is easy to understand and close to the employees. Therefore, no incomprehension of meaning should occur from the employee's side, they should understand when it is necessary to protect oneself from hazard occurrence and when the workplace is unsafe. It should be noted that some of the elements are already in use, either in potential national regulations requirements' realization or as a part of supranational corporate standards.

Uniform design of handed written information in a form of occupational safety lists would appropriately emphasize the level of danger and occupational hazard in given workplace or given type of occupational activity. It is true that the employee has to understand occupational-technological procedure content, although the purpose of the list is not the handover of new information. The purpose of the card is to remind and mainly emphasize the existing dangers and hazards.

An enhancement to current practice in the form of occupational safety list could be an impulse for industrial safety conditions' improvement in individual workplaces, an impulse for better working conditions' mapping and protection against their negative impact on employee's health, a tool that would improve employees' awareness within their workplaces, and an impulse for employees to improve their attitude while performing their occupational duties.

But most importantly, protects employer's health and life.

Aknowledgement

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