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OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEMS

Abstract: *Management systems are powerful tool for helping an organization fulfill its goals. This paper deals with occupational health and safety management systems, which are among the most common systems. Choosing the right management system can often be very difficult. The reason for this is the fact that there is a variety of occupational health and safety management systems. ISO standard for OHS management systems should make this decision easier. Comparing the elements of OHS management systems' structures indicate that there is a great similarity between these systems.*

Key words: occupational health and safety, management systems, standard

INTRODUCTION

Health and safety at work can be defined as the realization of working conditions where all necessary preventive measures are implemented to eliminate injuries and occupational diseases and to ensure protection of employees.

The goal of occupational health and safety is to:

- Promote and sustain the highest degree of physical, mental and social well-being of all employees;
- Prevent health deterioration caused by working conditions;
- Adjust workplaces to employees' capabilities.

In modern business world, health and safety results are highly appreciated and can have a significant impact on companies' overall success. Many successful companies are taking commitment to health and safety as an important factor when choosing their business partners. Potential clients are expecting from the companies to show their stability and social responsibility. Social responsibility is usually expressed in company's attitude toward environment, local community and its employees. Quite often, many companies are requiring from their potential business partners to have a certified management systems for certain areas as a proof of their commitment.

Occupational health and safety management system can be defined as a set of interrelated or interacting elements to establish OSH policy and objectives, and to achieve those objectives [1].

Companies most often implement occupational health and safety management systems by using specific guidelines. Lack of worldwide accepted guidelines lead to the development of their own by many countries. Some of those guidelines eventually become national and even international standards. However, the comparison of these guidelines shows many similarities. Some of the best known and the most used guidelines in this area are:

- BS OHSAS 18001, most popular OH&S standard in Europe and Asia;
- ANSI/AIHA/ASSE Z10, preferred in USA, which is expected since this standard is national standard;
- CAN/CSA-Z1000 standard issued by Canadian Standards Organization;
- ILO-OSH 2001 published by International Labor Organization and is a guideline on occupational safety and health management systems.

Occupational health and safety management systems are used to help organization to deal with its operational risks and to improve OH&S performances. An OH&S management system provides clear guidelines for more efficient management with all OH&S aspects, and are applicable in any business environment. These management systems give a special attention to incident preventions, risk reduction and employees' welfare.

The implementation of occupational safety and health management systems, which is often voluntary, i.e. implementation is not a legal obligation for employers but rather shows their commitment for improvement in this area, is a right path towards achieving success in this area.

OCCUPATIONAL HEALTH AND SAFETY MANAGEMENT SYSTEMS

Common thing for all OH&S management systems is that they are based on the PDCA Methodology. The essence of the PDCA cycle is continuously monitoring of results. In case of occupational health and safety management system PDCA cycle can be described as follows:

- Plan: establish the objectives and processes necessary to deliver results in accordance with the organization's OH&S policy;
- Do: implement the processes;
- Check: monitor and measure processes against OH&S policy, objectives, legal and other requirements, and report the results;
- Act: take actions to continually improve OH&S performance [2].

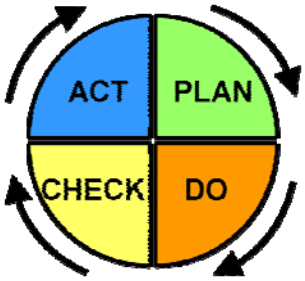

Figure 1. *PDCA cycle*

Most occupational safety and health management systems usually have elements shown on **Figure** 1.

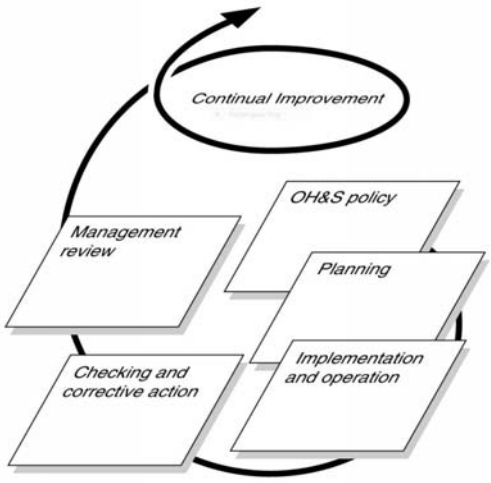

Figure 2. *Elements of successful OH&S management system*

OH&S policy is an initial document used by top management for expressing their goals in area of OH&S and confirming their commitment for continual improvement. This policy must be in line with organization's OH&S risk and it must show commitment to legal complying in area of OH&S. Policy must be communicated to all employees so that they know their obligations related to OH&S and should be available to all interested parties. Policy is periodically revised to insure it's appropriate and relevant to organization.

Planning is very important element of occupational health and safety management system and includes processes regarding a hazard identification, risk assessment and risk control. All activities and factors inside the organization must be taken in consideration. Then base on identified risks and with regard to legal requirements organization can determine its OH&S goal and establish programs for achieving these goals.

Implementation and operation of OH&S policy lead toward meeting the organizations goals. In order to achieve its goals organization must clearly define roles and responsibilities of employees and provide the necessary resources. Communication, participation and consultation of all interested parties must be in place. Documentation is one of key segments of management system so control of documentation is mandatory. Organization also must insure an operations control, by having adequate control measures in place, and must be prepared to respond to any emergency situation.

Checking in management systems is a way of determining its functionality through process of internal audits. Organization checks the functionality of management system by conducting monitoring and measurement of OH&S performances and periodically conducts evaluation of compliance to legal requirements. For each non-conformity, either real or potential, organization must take adequate preventive or corrective measures to eliminate them.

Management review was a purpose of finding possibilities for continual improvement. In this review management should evaluate management system efficiency, OH&S policy, objectives and performances.

ILO-OSH 2001 Guidelines

ILO-OSH 2001 Guidelines is for sure one of most important publication on subject of OH&S management systems. In this publication presented to the public in 2001 for the first time, International Labor Organization gave the guidelines for occupational health and safety management systems that later had a big influence on further developments on this subject. This was expected, if we have in mind the weight that this publication has, mostly because it is published by a specialized agency of United Nations dealing with labor issues, the leading and worldwide recognized organization in this area. What is also specific about this guidelines that there are adopted, as well as all

ILO's conventions and recommendations, by decision of tripartite representation system.

The basis for the guidelines given in ILO-OSH 2001 can be found in ILO's conventions no. 155 concerning occupational health and safety and the working environment and no. 161 occupational health services convention, while no. 170 convention concerning safety in the use of chemicals at work and no. 174 prevention of major industrial accidents convention had a significant influence in development of these guidelines.

In these guidelines, International Labor Organization encourages for integration of OH&S management system with other management systems and emphasizing the need for making OH&S an integral part of business management [3].

This guidelines does not mandatory require a certification although there is a possibility for this. First of all, this certification is used as recognition of good practice if this is the wish of the country implementing the guidelines [4]. In practice, cases of certification together with other OH&S standards, such as OHSAS 18001 or Z10, are most often.

The guidelines presented in ILO-OSH 2001 used a foundation for development of several new and the improvement of existing occupational health and safety management standard.

BS OHSAS 18001 standard

OHSAS 18001 is a standard presenting the requirements for occupational health and safety management systems. It has been developed with the international collaboration of standard institutions from different countries, and the first version was published in 1999. British Standards Institution had a leading role in the development of this standard. The standard was updated in 2007 when it was adopted as a British standard. OHSAS 18001 is internationally recognized and highly accepted in Europe and Asia. This standard is used a basis for development of the first international OH&S standard that will be published under ISO.

OHSAS 18001 provides tools for managing with occupational health and safety and is one of the most applied standards in this area. The number of organizations worldwide that choose to certify their OH&S management systems by OHSAS 18001 and consequently improvements in OH&S area that they have as a result of using OHSAS guidelines are best proof of quality of OHSAS standard.

From the start, OHSAS 18001 was developed to be compatible with two most used management systems – ISO 9001 for quality and ISO 14001 for environmental. Changes in 2007 made OHSAS more aligned with ISO 14001 and more compatible with ISO 9001 so integration of these management systems become much easier.

OHSAS standard consist of two documents:

- OHSAS 18001 Occupational health and safety management systems – Requirements. This document presents terms and definitions that are used and gives requirement that organization must meet if it wants to certify its OH&S management system according to this standard. As part of this document two informative annexes are given. First annex shows the correspondence between OHSAS 18001, ISO 14001 and ISO 9001 standards, which confirms the compatibility of these three standards and chance for making one unique management system. Second annex is a comparative review of requirements given in OHSAS 18001 and ILO-OSH: 2001. This review indicates that there are no significant differences between requirements given in OHSAS and ILO-OSH, so by certifying on OHSAS standard organizations is also meeting the requirements for OH&S management systems by International Labor Organization.
- OHSAS 18002 Occupational health and safety management systems – Guidelines for the implementation of OHSAS 18001. Core of this document are guidelines for meeting the requirements given in OHSAS 18001. These guideline can be very helpful since requirements in OHSAS 18001 document are given without a more detailed explanation. OHSAS 18002 helps organization to establish, implement or improve their occupational health and safety management system. Each requirement given in OHSAS 18001 here is explained in details with suggested tools that can help in meeting these requirements. From four annexes in this document two are completely the same as in OHSAS 18001. Other two are giving examples of hazards and comparison of risk assessment tools and methodologies.

ANSI/AIHA/ASSE Z10 standard

ANSI/AIHA/ASSE Z10 is a first standard for occupations health and safety management systems with national consensus in USA. First version of this standard was published in 2005 by American National Institute for Standards ANSI, founding member of International Organization for Standards ISO and only USA representative in this organization. This standard was developed in cooperation with American Industrial Hygiene Association AIHA. Work on this standard started in 1999 by team that consisted of numerous health and safety professionals. Standard is highly accepted in USA where over 7000 copies of 2005 version are sold. American Society of Safety Engineers ASSE was involved in further development of this standard so the actual version of this standard is issued as ANSI/AIHA/ASSE Z10-2012.

Great attention to compatibility with ISO 9001 and ISO 14001 was given when this Z10 standard was developed.

Although Z10 is accepted as national standard in USA, and great number of companies have certified their OH&S management systems by it, OHSAS is a choice of some American companies, predominantly those doing business in European and Asian markets.

CAS Z1000 standard

Canadian Association for Standards CAS published in 2006 occupational health and safety management system standard titled CAS Z1000. This standard was later approved by Canadian Council for Standards CCS and it reached a national consensus. Standard shows great similarity with other standards in this area like Z10, OHSAS 18001 and ILO guidelines. Specific for this standard is that it's closely aligned to specific legal requirements for OH&S applied in Canada.

Therefore it never achieved greater popularity outside of Canada. There are cases where Canadian companies have certified their OH&S management systems by both CAS Z1000 and OHSAS 18001. CAS Z1000 is compatible with ISO 9001 and ISO 14001 which makes their integration much easier.

ISO 45001 standard

Idea of creating internationally recognized standard for occupational health and safety management systems under ISO first emerged in mid 90ies [3]. First decision on this issue has made in 1996 when work group came to a conclusion that ISO should leave this task to International Labor Organization as more credible for giving OH&S guideline. British Standards Institution actualized this issue again in 1999 but they were faced with a strong international opposition and even campaign was lead to stop all BSIs efforts on this. This opposition can be attributed to the fact that this issue was raised by BSI at the time when ILO already spent more than a year working on guidelines for occupational health and safety management system that were published as ILO-OSH on January 2001.

This stopped all tendencies for creating ISO standard in this area for long time. Eventually this topic was brought to attention again in 2013 and for a first time ISO formed a technical committee named ISO/PC 283 with task to develop first ISO standard for occupational health and safety management systems. Final version of this standard, named ISO 45001 is expected by October 2016.

ISO 45001 will be a successor of OHSAS 18001, as it's vastly based on it. Development of ISO 45001 standard is done by following new guideline that ISO presented in Annex SL, framework for management system that all standard issued by ISO must follow, will significantly improve integration of management systems specially after ISO 9001 and ISO 14001 revision, planned for 2015 [5].

Publishing of ISO 45001 standards will lead to a harmonization in occupational health and safety management worldwide so that companies from different part of the world can compare their OH&S results easier.

INTERGRATED MANAGEMENT SYSTEMS

Integration of different management systems become a necessity because of the increasing number of companies implementing several management systems. Companies are choosing which management system will implement based on their needs and requirements of their clients. Management systems that are mostly integrated are by ISO 9000 standard for quality management, ISO 14000 standard for environmental management and by some of occupational health and safety management system standards, like OHSAS 18001 or Z10. These standards are one of most widely applied systems in the world as majority of companies have a need to achieve good results on these three areas. Beside these management systems following ones can be often found as a part of IMS: ISO 22000 standard for food safety management; ISO 22301 standard for business continuity management systems; and ISO/IEC 27001 - information security management standard.

Benefits of integrated management system are [6]:

- Integration of management systems is more efficient and cheaper than having separate management systems;
- Integrations rationalize the use of company resources by reducing the number of policies, documents and records;
- Managing of IMS goals is more efficient and easier than managing goal of individual systems;
- Internal and external audits of integrated management system are cheaper and more efficient than auditing of separate management systems;
- Overlapping of functions within the company is significantly reduced.

Main goal of integrated management systems is to provide a clear guidelines for a more efficient, effective and productive business [7].

Table 1. *Correspondence between OH&S management system*

Structure of OHS Standard	**ILO-OSH 2001**	**OHSAS 18001-2007**	**ISO/CD 45001**	**ANSI/AIHA/ASSE Z10-2012**	**CAS Z1000-06**
Scope	1	1	1	1	1
Reference publications	Bibliography	2	2	Appendix O	2
Definitions	Glossary	3	3	2	3
OHSMS					
General	3	4.1	4.1; 4.3; 4.4	3.1.1	4.1
Responsibility, accountability and authority	3.3	4.4.1	5.1; 5.3; 7.1	3.1.3	4.2.2.1
Management representatives	3.3.3	4.4.1	5.1	3.1	4.2.2.2
Worker participation	3.2	4.4.3	7.4.2	3.2	4.2.3
OHS policy	3.1	4.2	5.2	3.1.2	4.2.4
Planning					
General	3.8	4.3	6	4.0	4.3.1
Review	3.7	/	/	4.1	4.3.2
Legal and other requirements	/	4.3.2	4.2; 6.1.3	/	4.3.3
Hazard and risk identification and assessment	3.10.2.2	4.3.1	6.1.1-6.1.6	4.2	4.3.4
OHS objective and targets	3.9	4.3.3	6.2.1; 6.2.2	4.3	4.3.5
Implementation					
General	/	/	8.1	4.4; 5.1	4.4.1
Preventive and protective measures	3.10.1	4.4.6	8.1.1	5.1.1	4.4.2
Emergency prevention, preparedness and response	3.10.3	4.4.7	8.6	5.1.5	4.4.3
Competence and training	3.4	4.4.2	7.2	5.2	4.4.4
Communication and awareness	3.6	4.4.3	7.4.1; 7.3;	5.3	4.4.5
Procurement	3.10.4	4.4.6	8.4	5.1.3	4.4.6.1
Contracting	3.10.5	4.4.6	8.3; 8.5	5.1.4	4.4.6.2
Management of change	3.10.2	4.3.4	8.2	5.1.2	4.4.7
Documentation					
General	3.5.1	4.4.4	7.5.1	5.4	4.4.8.1
Control of documentation	3.5.2	4.4.5	7.5.3	5.4	4.4.8.2
Control of records	3.5.3	4.5.4	7.5.2	5.4	4.4.8.3
Evaluation and corrective action					
General	/	4.5	9.1	6	6
Monitoring and measurement	3.11	4.5.1	9.1.1	6.1	6.1
Incident investigation and analysis	3.12	4.5.3	10.1	6.2	6.2
Internal audits	3.13	4.5.5	9.2.1; 9.2.2	6.3	6.3
Preventive and corrective actions	3.15	4.5.3	10.1	6.4	6.4
Management review					
General	3.14	4.6	9.3	7.1	5.1
Continual improvement	3.16	4.6	10.2	4.3	5.2
Review input	3.14.3	/	/	7.2	5.3
Review output	3.14.4	/	/	7.2	5.4

CONCLUSION

There is a significant number of different guidelines, recommendations and standards for occupational health and safety management systems; therefore, great similarity in most of them is easily noticeable. Almost all management systems are based on PDCA methodology, they have similar structure and as the key element, they promote a continuous improvement.

The important factor when deciding which OH&S management system to implement is the markets where company is doing business. So if some company is oriented mostly on the USA market, then best choice is to certify its OH&S management system by Z10 standard or Z1000 in case of Canada, while companies oriented on international market will chose OHSAS 18001 standard [8]. Publishing of first ISO standard for OH&S management systems will bring a significant improvement in the process of integration of management system, and companies will much easier choose which OH&S management system to implement.

The implementation of OH&S management system gives a positive impact of health and safety performance and improves the overall efficiency in managing health and safety issues. OH&S management system provides a framework for risk identification and control reduces the number of potential incidents and makes meeting of legal requirements easier which all led to improvement of overall business results.

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BIOGRAPHY

Bojan Bijelić was born in Skopje, R. Macedonia, in 1985. He graduated in the field of Occupational Safety from University of Nis and currently is on Ph.D. studies in the area of Occupational Safety Engineering. He is currently working as a teaching assistant at Faculty of Occupational Safety in Nis.

SISTEMI UPRAVLJANJA BEZBENOŠĆU I ZDRAVLJEM NA RADU

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Apstrakt: *Sistemi upravljanja predstavljaju moćan alat koji pomaže organizaciji u ispunjavanju ciljeva. Ovim radom će biti obuhvaćeni sistemi upravljanja bezbednošću i zdravljem na radu, koji prestavljaju jedne od najprimenjivanijih sistema. Koji sistem upravljanja je najbolje implementirati je često pitanje na koje se teško nalazi odgovor. Razlog za ovo leži, pre svega, u činjenici da postoji veliki broj sistema upravljanja BZNR-om. Objavljivanjem ISO standarda za sisteme upraljanja BZNR-om trebalo bi da se donekle olakša izbor pravog sistema. Poređenje elemenata koji čine strukture najpopularnijih sistema upravljanja BZNR-om ukazuje na veliku sličnost koja postoji među ovim sistemima.*

Ključne reči: bezbednost i zdravlje na radu, sistemi upravljanja, standard.