QUALITY MANAGEMENT SYSTEM – RISK MANAGEMENT TOOL

SUSTAV UPRAVLJANJA KVALITETOM – ALAT ZA UPRAVLJANJE RIZIKOM

Snežana Živković, Ph.D.
Faculty of Occupational Safety in Niš, University of Niš
10a Čarnojevića street, 18000 Niš, Serbia
snezana.zivkovic@znrfak.ni.ac.rs

Josip Taradi, M.Sc.
University College of Applied Sciences in Safety, Zagreb
5 Ivana Lučića street, 10000 Zagreb, Croatia
josip.taradi@vss.hr

ABSTRACT

Risk management is an integral part of management decisions. Under the conditions of existence of the real danger of injuries emergence, occupational diseases or human casualties, risk management provides the direction of resources towards reducing the danger or their elimination. The quality management system requires the adoption of process approach in the organization, ie. management of multiple activities grouped and classified into processes. This paper presents the results of the research conducted in order to determine the current state of knowledge of persons responsible working for for occupational safety and health in Serbian companies. Based on the identified problems and research objectives, seven research hypotheses were set and survey method as suitable scientific research methods was used, as the main method as well as other specific statistical methods. The research was based on Žmegač's model of "Research of safety experts position in the Varaždin county" in 2008, and "Research issues of independent experts for occupational safety and health in medium-sized businesses in Croatia" in 2009 conducted by research team led by Taradi. The results of research indicates, among other things, the need of development of methods for assessing the occupational safety situation in the company and consistent application of standards OHSAS 18001 in order to achieve its positive effect as well as the existence of consciousness that for the improvement of work of people responsible for safety and health in the company it is necessary to plan and implement professional development and gain knowledge from management in this area.

Key words: risk management, quality management, occupational safety.

1. INTRODUCTION

Occupational safety and health at work includes the realization of working conditions in which they are taken certain measures and activities in order to protect life and health of employees. Implementation of the highest levels of occupational safety and health at work and reduction of professional diseases and work-related injuries to a minimum represents the general interests of society, all subjects and each individual.

The need of occupational safety implementation is based on the existence of certain risks. Risk at work is the probability as well as intensity of possible adverse events related to work, workers, workplace and work environment. Occupational safety situation depends on the successful implementation of safety at work relative to existing risks at work. Thus, a key prerequisite for planning and implementing occupational safety is an expert assessment of risk at work. [13]

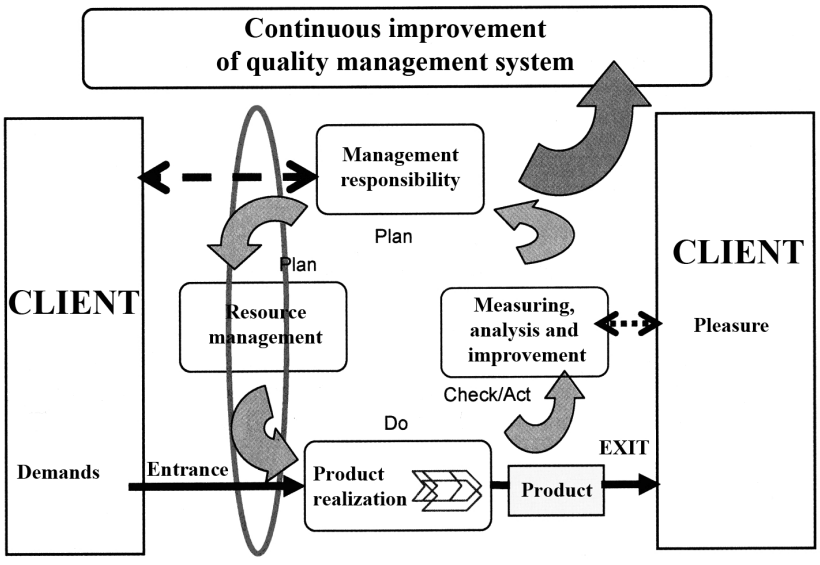
2. CONTEMPORARY CONCEPT OF QUALITY MANAGEMENT

Contemporary concept of quality management is based on eight principles of modern management: [10,12]

- **Focus on customers** - The organization depends on its customers, it should understand their current and future needs, meet their demands and try to overcome their expectations;
- **Leadership** - Executives should create and maintain internal environment in which employees will be fully engaged in fulfilling goals of the organization; [2]
- **Inclusion of employees** - Full engagement of employees enables their skills to be used for the benefit of the organization;
- **Process approach** - The desired results are achieved more effectively when the appropriate resources and activities are managed as a process;
- **System approach to management** - Identifying, understanding and management of the systems of interrelated processes for the realization of a given objective improve the effectiveness and efficiency of the organization;
- **Continuous improvement** - Constant organization goals are continuous improvements;
- **Making decisions based on facts** - Effective decisions are based on the analysis of data and information;
- **Mutually beneficial relationships with suppliers** - Organization and its suppliers are mutually dependent and mutually beneficial relationships increase ability to create value for both partners.

As for the quality management system, it can be said that it is an end-to-end process, as shown in Figure 1. At one end there is a client who says what he wants, and at the other end a client to say how much he is satisfied with the product or service he has received. [7]

Figure 1. Model for Quality Management System process



Source: Stoiljković Vojislav, Stoiljković Predrag, Stoiljković Bratislav, Obradović, Zoran, "Integrisani sistem menadžmenta", CIM College d.o.o, Niš, 2006, p. 103.

Management's responsibility. Executive management needs to demonstrate its commitment to:

- Create and maintain an awareness of the importance of meeting customer requirements;

– Establish a quality policy, quality objectives and quality plans;
– Establish a quality management system;
– Conduct a review of the management;
– Ensure the availability of resources.

Customers requirements. Executive management needs to ensure that:
– Needs and expectations of customers are determined and converted to customer requirements in order to achieve the trust of customers;
– Demands of their customers are fully understand and meet. [8]

Quality planning. The organization should identify and plan activities and resources required to achieve quality objectives. Planning should be coordinated with other requirements related to quality management system and the results should be documented.
Planning should ensure that the organizational changes are implemented in a controlled manner and to maintain a quality management system in these changes.
Resource management. The organization shall promptly determine and provide the resources needed to establish and maintain a quality management system. The organization should designate staff to assure that those who have responsibilities defined in the quality management system are competent on the basis of applicable education, training, skills and experience.
Product realization. The organization should ensure that these processes take place in controlled conditions and to produce outputs that meet customer demands.
The organization should determine how each process affects the ability to meet demanding product. An organization needs to implement an agreement on communication with the customer, in order to meet customer requirements.
The organization should prepare design plans and / or development involving:
– Phases of design and / or development;
– Required activities of review, verification and validation;
– Responsibility and authority for engineering activities and / or development.

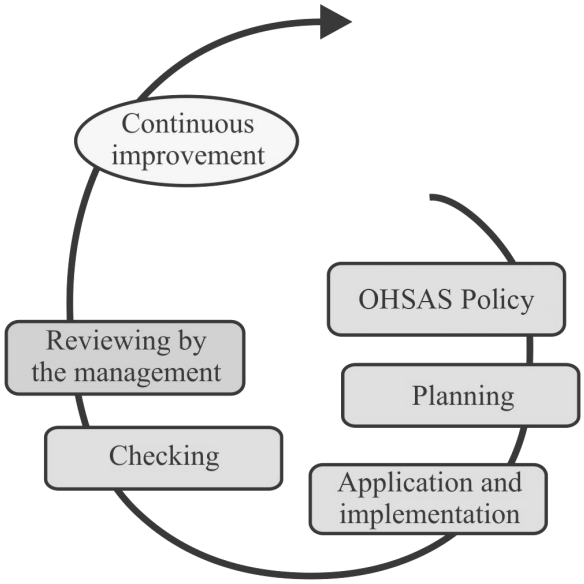
Measurement, analysis and improvement. The organization should define, plan and implement the processes of measuring, monitoring, analysis and improvement to ensure that the quality management system, processes and products and / or services comply with the requirements
There is a need to define the type, location, time and measurement frequency and control of records. Periodically it is needed to assess the effectiveness of the implemented measurement. The organization should identify and use appropriate statistical methods. The results of data analysis and improvement activities should be input into the review process by the management.
Customer satisfaction. The organization needs to track information about satisfaction and / or customer dissatisfaction and accordingly measurement and methods for obtaining and use of such information and data should be defined. [8]
In the model of quality management system Management's responsibility and Resource management are in phase *Plan.* **Product realization** is phase *Do,* and **Measurement, analysis and improvement** is phase *Check/Act*.

2.1. Occupational health and safety management

Occupational health and safety management system OHSAS 18001 includes: organizational structure and responsibility; planning activities; managing work; checking and reviewing

OHSAS policy in an organization and taking corrective measures.

Figure 2. Basic elements of OHSAS system



Source: Stoiljković Vojislav, Stoiljković Predrag, Stoiljković Bratislav, Obradović, Zoran, "Integrisani sistem menadžmenta", CIM College d.o.o, Niš, 2006, p. 162.

a. Organizational structure and responsibilities

In a management system, organization includes at least three elements of organizing:

1. Organizational structure with defined management rules and responsibilities and authorities assigned to each employee. In practice, it is a defined organizational structure and accurate systematization of jobs;
2. Procedural organization that includes the structure of jobs, distribution of tasks, order of task execution and input/output documentation for each activity. Procedural organization is necessary, because no organizational structure is competent and flexible enough to respond to market demands;
3. Teamwork which solves the problems of unplanned activities.

b. Planning OHSAS activities

Mandatory elements of planning occupational health and safety measures, according to OHSAS 18000 standards are:

1. OHSAS policy;
2. OHSAS objectives;
3. Plans for OHSAS measures and activities;
4. OHSAS management programs.

An organization must define the policy of occupational health and safety protection that clearly expresses objectives of occupational health and safety. [11]
Planning must include identifying hazards, assessing risks and risk management. The organization must establish procedures for identifying hazards, evaluating risks and applying necessary management measures, which include:

– Routine and non-routine activities;

– Activities of all personnel who have access to the workplace;
– Equipment in the workplace.

Methodology for identifying hazards and assessing risks must be defined in relation to the area of application, must provide risk classification and identify those risks that should be eliminated, in accordance with the experience of employees.
The organization must establish and maintain identification procedures and availability to legal and other OHSAS requirements which are changeable. An integral part of OHSAS plans are goals of the organization in terms of occupational safety and health. In this sense, the organization must establish and maintain documented objectives for occupational health and safety in all relevant positions and levels within the organization itself. OHSAS program should include documentation about responsibilities and authorizations of the appointed personnel for achieving objectives on the relevant positions and levels of organizations, funds and period of time in which the goals should be achieved. OHSAS program must be re-examined at planned intervals and changed in accordance

c. Managing the course of work

Basic set of OHSAS 18000 requirements relates to activities and measures that are planned and should be taken to manage the course of work. This includes:
1. **Structure and responsibility.** An organization must define, document and convey responsibilities and powers of persons who manage, implement and verify activities which influence OHSAS risks. Top level management has the ultimate responsibility for occupational health and safety; [3]
2. **Training, awareness and competence.** Staff must be competent to perform tasks that can affect occupational health and safety. [4] The organization must establish procedures which ensure that employees who work in relevant positions are aware: of the importance of compliance with OHSAS policies and procedures, consequences of their business activities on occupational health and safety, as well as benefits of improving personal performance related to OHSAS system, their roles and responsibilities, potential consequences if they deviate from the specified working procedures; [14]
3. **Consultation and communication.** An organization must establish procedures which ensure that information related to occupational health and safety are timely and accurately conveyed to all employees;
4. **Documentation. The organization must establish and maintain documentation**;
5. **Managing documents and data.** An organization must establish and maintain procedures to control all documents and data required by OHSAS 18000. It is necessary to be able to locate the documents, to periodically review them, to keep current versions of documents in all places where operations essential for the effective functioning of the OHSAS system are being performed, and to withdraw out-of-date documents promptly;
6. **Managing the course of work.** An organization must identify the processes and activities associated with established risks. The organization must plan these activities, to ensure that they are held under controlled conditions; [9]
7. **Readiness for accidents and response to them.** An organization must establish and maintain plans and procedures for identifying possible incident situations and accidents and how to deal with them, as well as the ones for prevention of injuries related to these cases. [1]

d. Checking and reviewing OHSAS policy organization and corrective measures

It is necessary, for the effective functioning of OHSAS system, to establish a system for

measuring, analysis and monitoring achievement of goals. For this, the following elements are needed:

1. **Measuring and monitoring performance.** Qualitative and quantitative measures should correspond to the needs of the organization, achievement of OHSAS goals should be monitored, in case of accidents, damage to health and incidents performance should be reactively measured, data and monitoring and measurement results should be recorded to facilitate analysis of corrective and preventive measures which follow them;
2. **Managing accidents, incidents and conflicts.** An organization must establish and maintain procedures for defining responsibility and authority for managing and analysis of accidents, incidents and conflicts, take action to mitigate the consequences of accidents, incidents and conflicts, initiate and implement corrective and preventive measures; [5,6]
3. **Records and management of records.** They have to provide easy tracing of the activities that are subject of records and they must be kept safely within time line which is defined and recorded;
4. **Internal review.** The organization must establish and maintain a program of internal checks and procedures for conducting internal audit, whose goals are to test compliance of system with the planned organization of OHSAS management and requirements of ISO 18001, oversight of system application, its effectiveness in relation to the policies and objectives of the organization, review the results of audits carried out and providing information on those results to the management;
5. **Review of OHSAS system performed by the management.** In certain time intervals, top level management of the organization has to perform the review of OHSAS management system, in order to ensure its permanent suitability, adequacy and effectiveness.

2.2. Management system documentation

In order to establish a management system in accordance with the ISO 18000 standards series it is necessary to do the mandatory documentation that includes:

- Rules of the quality system of health protection and occupational safety;
- Procedures;
- References and work instructions;
- Records (forms, reports, protocols, etc.).

This documentation should not present any parallel system, but must be included in the existing system of documentation in the field of occupational safety. In the event that the organization has a certified quality system in accordance with SRPS 9001:2001, documentation may be included in the existing quality system documentation.

3. REVIEW OF CURRENT RESEARCH ON ROLE AND IMPORTANCE OF PERSONS RESPONSIBLE FOR SAFETY AND HEALTH AT WORK

Analysis of literature in the field of occupational safety and health at work proves a weak representation of the role and importance of people responsible for safety and health at work, and especially the lack of empirical research work for persons responsible for safety and health at work in Serbian companies, so that this fact creates the need for such thematic research.

We will mention “Research of safety experts position in the Varaždin county” conducted by Žmegač in 2008. [15] Conclusion of the research is based on the knowledge that “the results arrived at by research showing that the position of safety professionals in the Varaždin county

is not on the sidelines." In particular, it can and should be distinguished "Research issues of independent experts for occupational safety and health in medium-sized businesses in Croatia" conducted by Project research team in 2009. [1]

4. RESEARCH METHODOLOGY

4.1. Research problem

The problem of this research is deficiency of current knowledge on the status of persons responsible for occupational safety and health in companies in Serbia, in accordance with obligations under the Occupational Safety and Health Law.

4.2. Aim of the research

The aim of the research is to determine current knowledge on the status of persons responsible for occupational safety and health in companies in Serbia.

4.3. Sample

The basic set of questionnaire survey conducted consisted of a total of 1,623 respondents. The data from their questionnaires have been included in the database. After eliminating irregular respondents (without company label, double and multy surveyed) 1,075 respondents were included into further analysis or 66.19% of the basic set of respondent.
In 1,075 companies a total of 235,509 workers are employed. The range of employees ranges from 1 as a minimum to 17,800 as the majority of employees in one company, while the average number of employees is 226. From 1,075 companies, there are 11 companies with one employee, 8 with two, while a total of 19 companies are with 3 employees.

4.4. Statistical methods

For processing and presentation of the research, the following statistical methods have been used: frequency (f), percentage (%), summation (Σ), average (M), standard deviation (s), population variability coefficient (V), chi-square test (χ^2), Pearson correlation coefficient (r), regression analysis, etc.

5. DISCUSSION

It is important to note that the vast majority of companies employ persons responsible for occupational safety and health, even 67.16% of respondents. It also cofirms that the employers have confidence to entrust complete management of occupational safety and health in the company to their own occupational safety expert. Confirmation of this confidence is the fact that the vast majority of persons responsible for occupational safety and health (71.07%) have an employment contract with indefinite duration. Moreover, majority of persons responsible for occupational safety and health (62.79%) is directly responsible to the management. This is also a ground for good and direct communication, occupational safety management at all business levels and organizational independence of persons responsible for occupational health and safety. On the other hand, it is an opportunity, and at the same time duty of the person responsible for occupational safety and health to prove their professional

skills through practice and prove the importance and usefulness of their profession.
Most people responsible for occupational safety and health (52.28%) perform only activities in the area of occupational safety and health which do not require any special authorization, although a significant percentage (38.87%) of respondents perform activities which require special authorization.
It is significant that a large percentage (30.51%) of respondents perform only activities in occupational safety and health, and in all other cases, there is some form of integral safety and activities from several areas of safety, and other common business functions. This fact implies the need and duty of professional education and training in wider areas of protection (occupational safety, fire protection, environmental protection, etc.), so that these persons can lead integral safety at satisfactory level at their companies.
It is encouraging that almost half of respondents (47.07%) are educated in the area of occupational safety, and more than a half has a university degree (56.09%), there is a certain number of respondents with even a higher degree. The point is that 60.84% of respondents have a professional qualification in the field of occupational safety, while most have some technical education, which confirms prevailing technical concept of occupational safety in business practice.
The weakest average marks in evaluating persons responsible for occupational health and safety and their cooperation with external participants in the occupational safety system are given to Evaluation of occupational safety as an economic factor by the entire economic system and Evaluation of perception and value of occupational safety as a social value by the public and society (3.44), Cooperation with professional associations (3.46), and Satisfaction with individual earnings of persons responsible for Occupational Safety and Health (3.47) and Financial working conditions for persons responsible for Occupational Safety and Health (3.54).
On the other hand, the best marks were given to Co-operation with bodies responsible for Labour inspection - occupational safety (4.17), the role of persons in Monitoring and analysing data related to injuries and occupational diseases (4.15) and Professional help to the employers and authorized persons in implementing and improving occupational safety and Training employees for occupational health and safety (4.12), and Cooperation with competent institutions for occupational safety (4.11).
Almost all marks for proposals for improving activities of people responsible for occupational safety and health are in range from 3.64 to 3.95, except for the proposal to increase the number of employees in the area of occupational safety and health (3.40). Out of all specific proposals, the best marked were the proposal for Increase of Salary and other benefits to the person responsible for safety due to adjustment with other employer services (3.92), and Stimulation of salary and other benefits to the person responsible for safety, depending on the results of improving occupational safety situation in the company (3.89), but also Additional education and professional development in the area of occupational safety for persons responsible for occupational safety and health (3.87).
Out of general proposals, the best marked were Obligation of continuous professional development in the area of occupational safety for persons responsible for occupational Safety and Health, Obligation of professional development in management skills (planning, organization, leadership, control, etc.) for persons responsible for Occupational Safety and Health, Improving information-sharing between persons responsible for occupational health and safety and external participants from occupational health and safety system using the Internet (3.95), as well as Legal advantage to persons responsible for occupational safety and health with professional background in the areas of safety when employing persons responsible for occupational safety and Health (3.94).

6. CONCLUSION

By this empirical research on work issues for persons responsible for occupational safety and health, with fulfilling set tasks and confirming suitability of selected scientific research methods, the set aim of the research has been achieved. Current facts on work issues for persons responsible for occupational safety and health in companies are established, and based on result analysis of the conducted research, they are reflected in acceptance or rejection of the set research hypotheses.

H1: *In majority of companies in Serbia, in accordance with the Law, the employer is obliged to have a person responsible for occupational Safety and Health.* The hypothesis is accepted.
H2: *The number of employees responsible for occupational safety and health depends on the number of employees, state of occupational health and safety and the level of hazards in that company.* The hypothesis is partially accepted.
H3: *In all companies who have implemented occupational safety and health management system according to an international guideline OHSAS 18001, occupational safety and health situation is essentially improved as well as activities of persons responsible for occupational safety and health.* The hypothesis is rejected.
H4: *People responsible for occupational safety and health only work in the field of occupational safety and health and do not work in other areas of safety.* The hypothesis is rejected.
H5: *Among persons responsible for occupational safety and health, majority (over 50%) are persons with professional qualification the field of safety*. The hypothesis is accepted.
H6: *Persons responsible for occupational safety and health in companies evaluate their own work, in all aspects with at least a very good mark (minimum of 3,5 on a scale from 1 to 5).* The hypothesis is partially accepted.
H7*: People responsible for occupational safety and health assess proposals for improving their own work in all aspects with at least a very good mark (minimum 3,5 on a scale from 1 to 5).* The hypothesis is partially accepted.

In general, respondents are advocating for improvement in the work, continuing education, and better financial conditions and compensation for their work.

REFERENTIAL LITERATURE

1. Božajić, I. Cmrečnjak, D., Drozdek, A., Filipović, A.M., Hunjak, D., Koren, T., Minga, I., Palačić, D., Petričević, N., Taradi, J., Žarak, M., *Stručnjak za zaštitu na radu. Istraživanje problematike rada samostalnog stručnjaka za zaštitu na radu u srednje velikim poslovnim organizacijama u Hrvatskoj*, Hrvatsko društvo inženjera sigurnosti, Zagreb, 2010.
2. Ivanova, T., Živković, S., Ivanov, A., „Kreativna organizacija“, Sabor psihologa 2011, 59. Naučno-stručni skup psihologa Srbije, Knjiga rezimea, str. 67., Sokobanja, 2011.
3. Markič, M., Kolenc, I., Šumanski M., Živković, S., „Izvršni menadžerji in preventivna varnost“, Delo in varnost br. 4/2010, str. 44-53, Ljubljana, 2010.
4. Markič, M., Nikolić V., Živković, S., „Obvladovanje znanja na področju varnosti in zdravlja pri delu“, Svet rada, vol. 7, br. 3/2010, Eko centar, centar za socio-ekološka istraživanja i dokumentaciju, str. 344-353, Beograd, 2010.
5. Николић, В., Живковић, С., „Управљање ванредним ситуацијама еколошког карактера са бихејвиоралног аспекта“, Ecologica, бр. 16, стр. 181-186, Београд, 2008.
6. Nikolić, V., Živković, S., „The behavioural context of accident prevention in the working and living environment and management of extraordinary situations“, NBP Journal of criminalistics and law, Vol. XV, No. 2, pp. 49-60, 2010.

7. Stoiljković, V., Stoiljković, P., Stoiljković B., Obradović, Z., *Integrisani sistem menadžmenta*. CIM College d.o.o, Mašinski fakultet Niš, 2006.
8. Stojanović, S., „Psychology of advertising – manipulation or life itself“, 6th International Conference Quality Management Dependability and DQM – 2003 Proceedings, pp. 182-189, Belgrade, 2003.
9. Živković, S., „Uloga ljudskih faktora u kontroli industrijskog rizika“, III konferencija Dani primenjene psihologije u Nišu, sa međunarodnim učešćem, Filozofski fakultet Niš, Departman za psihologiju, Centar za psihološka istraživanja, Tematski zbornik radova Ličnost, profesija i obrazovanje, str. 123-133, Niš, 2008.
10. Živković, S., „Savremeni koncept menadžmenta kvalitetom“, V konferencija Dani primenjene psihologije, Univerzitet u Nišu, Filozofski fakultet, Departman za psihologiju, Zbornik radova Obrazovanje, ličnost i rad, str. 245-268, Niš, 2009.
11. Živković, S., „Contemporary concept of quality management in living and working environment safety“, VI международной конференции: Инноватика-2010, Сборник научных работ, стр. 39-54, Ульяновский государственный университет, 2010.
12. Живкович, С., „Современный концепт менеджмента качеством в защите рабочей и жизненной среды“, VI международной конференции: Инноватика-2010, стр. 159-160, Ульяновский государственный университет, Ульяновск, 2010.
13. Живковић, С., *Улога и значај лица за безбедност и здравље на раду у привредним друштвима у Републици Србији*, Монографија, Универзитет у Нишу, Факултет заштите на раду у Нишу, 2011.
14. Живковић, С., Ракић, Т., „Утицај менаџмента људских ресурса на мотивисаност запослених за рад и безбедност и здравље на раду“, Међународни научно-стручни скуп: Менаџмент, иновације, развој, Врњачка бања, 2009.
15. Žmegač, B., „Istraživanje položaja stručnjaka zaštite na radu u Varaždinskoj županiji“, Menadžment i sigurnost, III Znanstveno-stručna konferencija s međunarodnim sudjelovanjem, Varaždin, 2008.

Sažetak:

SUSTAV UPRAVLJANJA KVALITETOM – ALAT ZA UPRAVLJANJE RIZIKOM

Upravljanje rizikom predstavlja integralni dio odluka menadžmenta. U uvjetima postojanja realne opasnosti nastajanja ozljeda, profesionalnih bolesti ili ljudskih žrtava, upravljanje rizicima osigurava usmjeravanje resursa prema smanjenju nastanka opasnosti ili njihovom otklanjaju. Sustav upravljanja kvalitetom zahtjeva usvajanje procesnog pristupa u organizaciji, tj. upravljanje brojnim aktivnostima grupiranim i razvrstanim u procese. U radu su prikazani rezultati provedenog istraživanja sa ciljem utvrđivanja aktualnih saznanja o stanju rada osobe za sigurnost i zdravlje na radu u poslovnim organizacijama u Srbiji. Na osnovi identificiranog problema i cilja istraživanja, postavljeno je sedam hipoteza istraživanja, gdje su kao prikladne znanstvene istraživačke metode korištene metoda ankete, kao glavna metoda i specifične statističke metode. Istraživanje je koncipirano po modelu Žmegačevog "Istraživanja položaja stručnjaka zaštite na radu u Varaždinskoj županiji" iz 2008. godine i "Istraživanja problematike rada samostalnog stručnjaka za zaštitu na radu u srednje velikim poslovnim organizacijama u Hrvatskoj" koje je proveo projektni istraživački tim sa Taradijem kao voditeljem istraživačkog projekta, tijekom 2009. godine. Rezultati istraživanja ukazuju, između ostalog, na postojanje potrebe razvoja metoda za ocjenjivanje stanja sigurnosti na radu u poslovnoj organizaciji i dosljedne primjene norme OHSAS 18001 u cilju postizanja njegovog pozitivnog efekta kao i na postojanje svijesti da je za unapređenje rada osoba za sigurnost i zdravlje na radu i stanja sigurnosti u poslovnoj organizaciji potrebno planirati i provoditi stručno usavršavanje i stjecati znanja iz menadžmenta u ovom području.

Ključne riječi: upravljanje kvalitetom, upravljanje rizikom, sigurnost na radu.