ISO 45001:2018 - CONCEPT OF MANAGING THE PROCESS OF OCCUPATIONAL HEALTH AND SAFETY

Abstract: This paper presents the theoretical settings of the process management and process approach with an emphasis on the application of the occupational health and safety management concept according to ISO 45001:2018 standard. The first part of the paper presents the theoretical framework of process management and process approach, with a description of the implementation of the process approach, process planning, process analysis, and corrective actions. The second part of the paper emphasizes the importance of process management and process approach for organizing and managing activities, in order to create value for the organization, clients and other stakeholders. International Standard ISO 45001:2018 encourages the adoption of a health and safety management process. The concept of process managing in occupational health and safety is defined by the structure and requirements of the standard itself, and it is known as the PDCA (Plan-Do-Check-Act). The paper presents the concept of managing occupational health and safety processes according to ISO 45001:2018.

Keywords: concept, occupational health and safety, ISO 45001:2018, process management.

INTRODUCTION

Process Management and Process Approach

As a rule, organizations are traditionally set up and managed in a functional way with an organizational scheme. Whether it is a hierarchical, functional, divisional or a matrix system, the focus is on managing defined entities within the application scope. However, these entities cannot provide external value by themselves. Value is created collectively, by cooperation between all functional entities [1].

There are numerous process definitions, but generally, we can say that process is a set of linked or mutually dependent actions that will increase the size of the result. Today, process management is a well-established management tool. Process management aims to increase efficiency, which is therefore considered essential for both economic development and the economy as a whole. The review of the scientific literature reveals numerous theoretical concepts that can be very different from each other, even to the point of mutual contradiction [2]. Process management has become an inspiration and the foundation of numerous research and application initiatives. As far as management theory is concerned, one of the trends in organizational management is a process approach that comprehensively and horizontally follows the structure of the organization. In this approach, the selected elements of the organization are coordinated by a particular process manager, who is responsible for process coordination [3]. With the process approach, processes are trying to be more visible. There are many definitions of process approaches, i.e. process orientations. The concept of process approach refers to the description of an organization that highlights the holistic processes by which a certain value in the whole chain of product or service is defined. Also, the process approach can be described as a constituent of structure, focus, measurement, ownership, and user [4].

Research goal and purpose

The development and improvement of the process of health and safety management depend on a number of factors. Among other things, international standards in the field of occupational health and safety have also significantly contributed to its development. Consequently, the purpose of this research is to gather new insights into the concept of managing the process of occupational health and safety according to ISO 45001:2018.

The aim of the research is to define and present the concept of occupational health and safety according to ISO 45001:2018 for effective occupational health and safety.

Research tasks

In accordance with the set goal, the research tasks are:

- to analyze and display theoretical process management and process approach
- to analyze and present the basic requirements and structure of the standard ISO 45001: 2018
to define and present the concept of the management process in occupational health and safety in accordance with ISO 45001:2018.

Methods
Scientific methods were chosen based on the problem, goal and tasks of scientific research. To this end, a number of scientific methods have been applied; their combinations and order make the established research methodology and meet the requirements of planned theoretical research. Research methods represent a way of solving the problem effectively. The analysis involved the following issues:

- theoretical settings of the process management
- theoretical settings of the process approach
- content requirements and structure of standard ISO 45001:2018
- the possibilities of establishing the concept of occupational health and safety according to ISO 45001:2018.

Theoretical settings of process management, the process approach and occupational safety are analyzed from the selected scientific literature. In this case, a combination of deductive and inductive analysis is used to classify and summarize the theoretical basis of the research subject. The content analysis method compares theoretical settings. Descriptive method was used to describe the essential features and the very concept of management. After carrying out the analysis and comparison, key features are synthesized, conclusions are drawn, and the concept of health and safety management process is defined according to ISO 45001:2018.

RESULTS AND DISCUSSION

Process management theory
A process is a set of activities that are interconnected or are interacting with each other. Processes use the resources to convert inputs into outputs. Inputs and outputs are interconnected because the output from one process often becomes the input for the second process. ISO standards define the output as a "process result".

The business process with its activities uses certain business resources (human, material, financial, time, information, etc.) in order to meet the needs of the users in the widest sense. Process output attains the set goal and achieves a new value for the organization [5]. The process can be defined as a series of logically related activities it actually consists of, with clearly defined inputs and outputs from the process [6].

Business process management focuses on improving corporate performance through the management and optimization of a company's business processes. Therefore, process management can be described as a process of optimizing processes. Process management enables the organization to be more efficient, more effective and more capable for change than when it is functionally oriented, with a traditional hierarchical management approach [7]. It can be said that the process itself is a system or a certain logical structure. It consists of elements, sub-processes, process steps, activities, compounded by a certain logical developing sequence and has its own function. Building a process is an indirect way to build a complete business system or a functioning system, which consists of various subsystems - organizational structure, documentation, information, communication, management subsystem, and process structure, and so on [8].

Business Process Management combines a managerial approach with the appropriate technology to improve the company's performance. Business Process Management (BPM) is a systematic approach to improving business based on formatting, measurement, analysis, improvement, and process management. Business Process Management is the systematic approach to improving the business processes with the ultimate goal of achieving business goals. It covers the entire life cycle of the process: from defining and modeling to performance, analysis, and process optimization.

Business is a system of integrated processes. According to Bosilj Vukšić, Hernaus and Kovačić, the basic characteristics of business processes are the following:

- every process has a purpose
- each process has its owner
- each process has a beginning and the end
- the inputs enter the process, and outputs are results
- the process is composed of sequentially performing activities
- based on the inputs and outputs of the process, it is easy to determine the success of the process
- the process should be maintained by well-known internal and external suppliers and consumers to be sustainable
- improving the process is inevitable [4].

Depending on the context in which the business process is mentioned there are several process classifications. Every business organization is special and must be observed through the interconnectedness of business processes and their associated dimensions. Regardless of the size, activity or other specifics of the organization, all companies have a whole series of common processes and business dimensions:

- division by organizational structure
- division by time intervals
- division by territory
- division by product and service categories
- division by suppliers and buyers.

According to the field of internal processes within the organization, the following division is possible:

- individual processes performed by individuals
- vertical (functional) processes that are part of a function unit or department of an organization
- horizontal processes that go through several function units.
All processes can be more or less successful. Successful processes have their own characteristics, namely:

- the process should be directed to the user who is intended to exit the process
- processes outputs should constantly provide added value
- the process needs to have a capable process owner
- the process is understandable to everyone and decision-making involves all those involved in the process
- measures of success and efficiency of the process have been set
- it is necessary to continuously improve the process

**Process approach theory**

The process approach is a management strategy. When managers use a process approach, it means managing and controlling the process that their organizations conduct, interactions between these processes, and inputs and outputs that connect these processes. This also means managing these process interactions as a system.

Applying process approach allows you to organize user requests and enable continuous improvement. The process approach implies that an organization manages its business or activities as a systematic process, rather than departments, people or products. It can be stated that the concept of process approach serves the description of an organization that highlights the holistic processes by which the whole value chain of product or service is managed. Also, the process approach can be described as a constituent of structure, focus, measurement, ownership, and user.

The purpose of applying a process approach is to improve the way organizations are arranged and to manage an organization effectively and efficiently. This approach requires the adoption of a radically new and completely logical way in which organizations perceive their activities. It implies identifying, understanding and managing business processes of a company. All of these processes already exist within the organization (using these processes in everyday activities), but they are invisible.

The processes are different, first and foremost, by their nature and degree of complexity, and have a certain structure. Their simplest parts or components, at the next lower level, are the sub-processes or process steps. In addition, it is needed to build processes through the methodology chosen by the organization, and it is equally necessary for its consistent application in the processing of all components of a process. The reason for this is the fact that it is common that output from one process simultaneously becomes an input into another process, and almost always is an output from one process step at the same time input to another process step of the same process.

In this way, multiple systems processes become recognizable and interconnected. The interconnections between the several processes of synergy are recognized as a process approach.

The process approach is a management strategy that includes the Plan-Do-Check-Act (PDCA) cycle and risk-based thinking. This means processes are managed and controlled. It also means not only to understand what the underlying processes are but how they fit in.

The process approach involves establishing the organization's processes in a way that they act as an integrated and complete system. The management system integrates the processes and performs the necessary measurements to achieve the goals. Processes define interrelated activities and checks to achieve the desired results. Detailed planning and controls can be defined and documented as needed depending on the organization's context. The process approach in its essence must include risk-based thinking. Risk-based thinking in the process approach applies to:

- deciding how to address the risk (positive or negative) in establishing processes for improving outputs and preventing unwanted results
- defining the scope of process and controls on the risk basis
- improving the efficiency of the management system
- maintaining and managing a system that substantially solves the risk and meets the goals.

**Establishment of ISO Standard 45001:2018**

According to the International Labor Organization (ILO) calculations for 2017, around 2.78 million deaths occur every year in workplaces around the world. Every day almost 7700 people die of a work-related illness or work injuries, and each year there are about 374 million injuries and work-related illnesses causing job absences. ISO has therefore assigned the ISO/PC 283 project committee to prepare the ISO Standard 45001:2018 that will provide a framework to increase safety, reduce risk and improve workplace health, enabling the organization to proactively improve its health and safety performance at work. ISO Standard 45001:2018 was published on March 12, 2018, and replaces the Standard BS OHSAS 18001:2007. The purpose of ISO 45001 is to enable the organization to proactively improve its health and safety performance in the prevention of injury and disease. ISO 45001 is much easier to integrate with other standards for management systems (ISO 9001, ISO 14001, ISO 27001, etc.) than was the case with OHSAS 18001. The application of ISO 45001 provides conditions and guidelines for system and structure applications to protect employees and reduced risk. The standard is designed to be effectively integrated into existing management systems and complement related programs for occupational health and safety.
ISO 45001 monitors HLS's "High-Level Structure" structure as defined in the Annex SL, which is used for revised editions of ISO 14001 and ISO 9001 published in 2015. Annex SL describes the framework for the generic management system and creates a template for management systems. This means the standard has a common structure with all new and revised ISO management system standards.

**Annex SL**

Over the past few years, the International Organization for Standardization (ISO) has published a number of management system standards covering areas of quality, environment, food safety, information security, risk management, etc. Although all standards had common elements, each had its own structure requirements that led to some problems with the introducing, especially if the integrated system was implemented [13].

In order to avoid such problems in the future, ISO published in 2012 a new guideline called Annex SL. The purpose of this guideline is to provide the same structure, text, common terms and definitions for all new standards of a management system when creating new standards.

All standards published after the adoption of Annex SL are accompanied by HLS "High-Level Structure". The structure of the standard defined in Annex SL is used for all revised editions, as well as for new standards. This means that the standards have the same structure [14]. According to Annex SL, the basic structure of all standards contains 10 chapters.

By studying compliance requirements before applying Annex SL with HLS and following their application in structuring different standards, significant differences in overlapping requirements were noted, which also facilitated the simpler integration and merging of different standards into a single integrated management system. By applying Annex SL, a unique concept of process management according to international standards is created.

**Figure 1. Overlapping requires different standards in an integrated management system before the application of Annex SL**

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**Figure 2. Overlapping requires different standards in an integrated management system after the application of Annex SL**

**Process management concept according to ISO 45001:2018**

The elements of the process management concept of occupational health and safety represent the structure of the requirements of the ISO 45001 standard that is conformed with Annex SL. Below are the basic elements of the requirements that constitute the concept of managing the process of occupational health and safety according to ISO 45001: 2018.

**1 Scope**

The standard specifies the requirements of the Health and Safety Management System (OH&S) requirements and provides guidelines for its use, enables organizations to provide safe and healthy work environments by preventing workplace injuries and disease as well as proactively improving OH&S performance. It applies to any organization that wants to establish, implement and maintain a management system to improve occupational health and safety, eliminate dangers and minimize risks, take advantage of OH&S opportunities, and eliminate the nonconformity between OH&S management systems associated with its activities.

**2 Normative references**

There are no normative references in this standard.

**3 Terms and Definitions**

A total of 37 terms and definitions were stated and explained.

**4 Organization context**

4.1 Understanding the Organization and its Context

Understanding the organization's context is used to establish, implement, maintain, and continually improve its OH&S management system. Internal and external issues can be positive or negative and include conditions, characteristics or changing circumstances that may affect the OH&S management system.

4.2 Understanding the needs and expectations of workers and other interested parties

Interested parties, in addition to workers, may include: legal and regulatory bodies (local, regional,
active support, and feedback, are crucial to the success of OH&S management, including awareness, responsiveness, leadership and commitment to top organization.

5.1 Leadership and Commitment

Leadership and commitment to top organization management, including awareness, responsiveness, active support, and feedback, are crucial to the success of OH&S management system and achieving the desired outcomes. Therefore, the organization's management has specific responsibilities that need to be personally involved or directed.

4.4 OH&S Management System

The organization retains authority, responsibility and autonomy to decide how it will meet the requirements of this standard, including the level of detail and scope. If this norm is implemented for specific parts of an organization, rules and procedures developed by other parts of the organization may be used to meet the requirements of this standard, given they are applicable to a particular part or parts that will be subjected to them and are in compliance with the requirements of these standards.

5 Leadership and workers participation

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5.2 OH&S policy

OH&S Policy is a set of principles outlined as an obligation in which top management describes the long-term direction of the organization to support and continuously improve its OH&S implementation.

5.3 Organizational Roles, Responsibilities and Authorities

People involved in OH&S organization management system should have a clear understanding of their roles, responsibilities, and authorities to achieve the desired OH&S management system outcomes.

5.4 Counselling and workers participation

Employee counseling and participation, and where available, employee representatives can be key success factors for the OH&S management system and should encourage them through the processes established by the organization. Counseling implies two-way communication that includes dialogue and exchange.

6 Planning

6.1 Risk and Opportunity managing Actions

Planning is an ongoing process that takes into account changing circumstances and continuous risk and opportunity determination, both for workers and the OH&S management system. Unwanted effects may include work injury and illness, non-compliance with legal requirements and other requirements or damage to reputation, etc. Planning considers relationships and interactions between activities and requirements for the management system as a whole. OH&S is concerned with the identification of dangers, the way they communicate, and by analyzing and mitigating the known dangers, and the strategies of system improvement.

Hazard identification begins at the conceptual design stage of any new workplace, facility, product or organization, and lasts throughout the life cycle to reflect current, changeable, and future activities. The organization can use various methods for assessing OH&S risk as part of its overall strategy to address different dangers or activities. The methodology and complexity of the assessment depend on the dangers associated with the organization's activities. The assessment process should consider OH&S opportunities and other opportunities, their advantages, and the potential to improve OH&S performance.

The organization must establish legal and other requirements that apply to its dangers, OH&S risks and OH&S management system. Planned activities should primarily be led through the OH&S management system and include integration with other business processes such as those established for environmental management, quality, business continuity, risk, financial or human resources. When risk assessment and other OH&S risks determine the need for control, activity planning determines how they are carried out during work (for example, determining whether to include these controls in work instructions or actions to improve competencies).

6.2 OH&S goals and planning their achievement

Goals are set up to maintain and improve OH&S performance and should be associated with the risks, opportunities, and performance criteria the organization has found necessary to achieve the desired OH&S management system outcomes. OH&S goals can be integrated with other business goals and should be set to the appropriate functions and levels. Goals may be strategic, tactical or operational. The organization can plan to achieve goals individually or collectively.
7 Support
7.1 Resources
The examples of resources are human, natural, infrastructure, technology, and financial.
7.2 Competence
Worker qualifications should include the knowledge and skills needed to adequately identify danger and address the OH&S risks associated with their work and workplace.
7.3 Awareness
In addition to workers (especially temporary workers), contractors, visitors, and other parties should be aware of the OH&S risks to which they are exposed.
7.4 Communication
The communication process established by the organization should ensure the collection, updating and sharing of information. It should also ensure that relevant information is provided, received and understood by all relevant workers and interested parties.
7.5 Documented information
It is important to keep the complexity of documented information at the lowest possible level to ensure efficiency, effectiveness and simplicity at the same time.
8 Work process
8.1 Operational planning and control
It is necessary to establish and implement operational planning and control processes to improve occupational health and safety, eliminate dangers or, and if this is not possible, reduce OH&S risk to the level as small as possible for operational areas and activities. Hierarchy control aims to provide a systematic approach for enhancing occupational health and safety, eliminating dangers and reducing or controlling OH&S risks. Measures that can be implemented at each level are removal; replacement; engineering controls, job reorganization, or both; administrative controls, including training; personal protective equipment.

The goal of the management process change is to improve occupational health and safety, minimizing the risk of introducing new hazards and OH&S risks in the work environment, how changes occur (e.g. technology, equipment, facilities, work procedures and procedures, specifications, staff, standards or regulations).

The procurement process should be used to identify, assess and eliminate the risk and to reduce the OH&S risk, in products, hazardous substances or substances, raw materials, equipment or services prior to their introduction into the workplace. The organization should coordinate procurement processes with its contractors in order to identify the risks and risk assessment and control. The organization can achieve coordination of the activities of its contractors through contracts that clearly define the responsibilities of the involved parties and confirm that the contractors are able to perform their tasks before being allowed to continue their work. When outsourcing services are used, the organization must have control over the outsourced functions and processes to achieve the desired outcome of the OH&S system.

8.2. Preparedness and response to emergency situations
Emergency alert plans may include natural, technical and anthropogenic (created by man) events occurring inside and outside normal working hours. The organization must establish, implement and maintain the processes needed to prepare and respond to potential emergency situations.

9 Performance evaluation
9.1 Monitoring, measuring, analyzing and valuing successes
9.1.1 General
To achieve the desired outcomes of OH&S management systems, processes need to be monitored, measured and analyzed. Examples of what can be monitored and measured are: complaints about occupational diseases, workers health (through control) and work environment; incidents at work, injuries and illnesses, and complaints, including trends; the effectiveness of operational controls and exercises in case of emergencies, or the need for modifications or implementing of new controls; jurisdiction, etc. Monitoring may include continuous verification, oversight, critical observation, or status determination to identify a change from the required or expected level of implementation. Examples include the use of interviews, review of documented information, and observations of the work being performed. Measurement generally involves numerical evaluation of objects or events, which is the basis for quantitative data and is generally associated with the assessment of the performance of security programs.

9.1.2 Conformity Assessment
Frequency and time of compliance assessment may vary depending on the importance of the application, changes in working conditions, changes in legal regulations and other requirements, and on the previous work of the organization. The organization can use different methods to maintain its knowledge and understanding of compliance status.

9.2 Internal Audit
The scope of the audit program should be based on the complexity and level of maturity of the OH&S management system.

The organization can establish the objectivity and impartiality of internal auditing by creating processes that separate the role of an auditor as internal auditors from regular assignments, or the organization may also use external persons for that function.
9.3 Revision of the management system
The management must review the OH&S management system at planned intervals to ensure continued suitability, adequacy and efficiency.

The system review involves considering a total of seven different information and data.

10 Improvement

10.1 General
The organization should take into account the results of the analysis and evaluation of OH&S performance, conformity assessment, internal audits and review of management systems when undertaking improvement measures.

10.2 Incident, nonconformance and corrective action
There are different processes for incident investigation and nonconformity assessment, or they can be combined as one process, depending on the organization's requirements.

10.3 Continuous improvement
Examples of permanent improvements include new technology, good practice, both internal and external, suggestions and recommendations from interested parties, new knowledge and understanding of occupational health and safety, new or improved materials, changes in the ability or skill of workers, and achievement of improved performance with less resources (e.g. simplification, relief, etc.).

CONCLUSION
The development and improvement of the occupational health and safety management process depend on a number of factors. Among other things, an international standard in the field of occupational health and safety also gives a significant contribution to its development. Independently from a number of known definitions, the process is defined as a series of logically related activities with clearly defined inputs and outputs. The implementation of occupational health and safety is necessary for the normal functioning of a business organization, and the application of such an approach creates special value for the organization.

It can be stated that the aims and tasks of this research have been achieved. Theoretical settings of process management and theoretical settings of the process approach have been determined by the research conducted. An analysis of the requirements of ISO 45001: 2018 and discussion of all elements of the management process were carried out. Key elements of the process of occupational health and safety management are presented in the introduction of the
standard requirements. The approach to the occupational health and safety management system applied in this standard is based on the concept of Plan-Do-Check-Act (PDCA). The international standard ISO 45001:2018 encourages the implementation of a health and safety management process. The concept of managing the process of occupational health and safety is defined by the structure and requirements of the standard itself. Standards requirements must be inspected from the perspective of the system and must not be considered separately, i.e. there may be the interconnection of requirements at one point of the standard with the requirements of other clauses of the standard. The PDCA concept is a continuous, iterative process used by organizations to achieve continuous improvement.

To continue the research, it is suggested to initiate research on each step of the PDCA concept in the process of health and safety management at work. This research will collect data on the impact of particular PDCA elements and their relevance in achieving performance indicators of the health and safety management process according to ISO 45001:2018.

REFERENCES


BIOGRAPHY of the first author

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