MONITORING STUDY OF THE WORK SYSTEM AIMING TO REDUCE THE RISK OF WORKPLACE INJURIES

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Abstract: As an important part of the industrial organization of the technical-social systems, the safety and health systems at work include labor relations intended to confer sustainability on the work processes on the one hand, and on the other hand, to ensure the safety and health of workers and reduce the risks of accidents. Compliance with the legal norms regarding safety and health at work is not enough, being necessary a series of organizational measures related to the specifics of the economic activity, to ensure the reduction of risks and the avoidance of workers' injuries. The work aims to contribute to the improvement of the systems for safety and health at work from a functional and structural aspect, using modern research tools.

Key words: Monitoring, health and safety systems, risk assessment.

1. INTRODUCTION

Monitoring of occupational health and safety management systems is a crucial central element in the process of continuous improvement and serves to verify if the system is operating as expected. The goal is to identify system deficiencies and take action to remedy and improve its performance. By applying the requirements of standards for OHS management systems concerning monitoring, "mechanisms for evaluating system efficiency are built. In this stage, shortcomings are identified, and decisions and corrective measures are taken."

Methods used for monitoring and evaluating management systems include workplace inspections, assessments of the organization's safety and health status, tracking of occupational accidents, and analysis of employee requirements and observations.[1] Performance criteria of management systems, besides accident or illness rates, may also include coefficients that indicate the degree of worker involvement and participation.

Regardless of the organization's size or the nature of its activities, there are no workplaces where there are no accident hazards. The risk of occupational accidents and illnesses, in the most widespread sense, is characterized by the probability and consequences of the occurrence of a hazard. The purpose of risk assessment is to identify hazards in the workplace and establish prevention and control measures. Risk management - the process of decision-making, by considering the effects of uncertainty on the achievement of objectives and establishing the necessary measures and actions.[2]

2. DIMENSIONS OF OHS MANAGEMENT SYSTEM

Occupational health and safety management systems can be characterized as having two dimensions: a structural one and an operational one. The structural dimension represents the formal description of the system containing safety policies, rules, procedures, work instructions, and occupational safety instructions. Essentially, all of these demonstrate the "theoretical" or paper-based functioning of the OHS management system. The operational dimension consists of the "practical" functioning of the system, which often differs from what is described in the system documentation.

To determine the performance of the OHS management system, the performance of both dimensions of the system must be taken into account. Structural performance can be defined as the level of compliance of the system's internal processes (established through procedures, instructions, policies) with the formal requirements of standards for management systems. Essentially, this aspect represents the level of integration and influence of formal processes in the practices used routinely and in the work environment. Performance indicators for structural performance may include:

– the level of worker satisfaction with the training received;
– the degree of adaptation of training programs to the actual needs of workers;
– the ability to implement the information received by workers following training;
– sufficient number of trained individuals in various work teams.

The operational performance of the management system focuses primarily on "what the system does" rather than "what the system has."[11]

Monitoring of management systems can be of two types, depending on the timing of the action:

- active or proactive monitoring, which is carried out before an undesirable event occurs;
- reactive monitoring, which is carried out by investigating occupational accidents, illnesses, or events resulting only in material damage.

Tabel 1. Performance indicators

Indicators with reference to the past	Indicators with reference to the present	Indicators with reference to the future
-Statistics of occupational accidents and illnesses; -Costs incurred by disabilities resulting from occupational accidents; -Compensation expenses for workers following occupational accidents; -Fines imposed by state inspections	-Non-compliances identified in the workplace; -Investigation and analysis of occupational accidents; -Frequency of occurrences of potentially hazardous cases; -Monitoring the health status of workers; -Effectiveness of periodic training; -Establishment of actions in response to workers' complaints/suggestions.	-Number of repeated injuries; -Workers' perception of OHS; -Quality and quantity of complaints and suggestions; -Management involvement in resolving OHS issues.

Active monitoring of organizational activities should be planned according to the level of risk of injury, with priority given to those with a high risk of accidents.[10] In practice, when risk control measures fail, reactive monitoring will uncover, through investigations, the causes that led to the respective injuries or losses.[10]

Performance criteria of management systems may target indicators related to the organization's past, present, and future safety conditions. Table 1 proposes a series of performance indicators based on this classification.

3. MEASURING PERFORMANCE OF THE OHS MANAGEMENT SYSTEM

From the specialized literature, three types of approaches for measuring the performance of OHS management systems emerge [3]:

1. results-based;
2. compliance-based;
3. process-based.

The results-based methodology involves tracking the organization's outcomes (such as the rate of workplace accidents, occupational illnesses, temporary incapacity rate, number of hazardous substances with up-to-date safety data sheets, etc.) and determining whether the implemented management system is effective or not. This reactive methodology is the most widespread because it is easy to implement, requiring fewer financial and time resources. However, the disadvantage of this approach is that it does not assess both the structural and operational aspects of the OHS management system.

The classic method for measuring the performance of the OHS management system is the compliance-based approach. This involves assessing the degree of compliance of the management system with standard requirements through audits.

Table 2. Performance criteria and associated indicators

Performance criteria	Performance indicator
Completion of planned activities: • Training sessions; • Operational checks; • Periodic medical examinations.	The percentage of completed activities out of the total planned.
Reporting and investigating workplace accidents	Number of: • Reported minor workplace accidents or incidents; • Investigated minor workplace accidents or hazardous incidents; • Preventive measures taken following accident investigations.
The attitude and perception of workers towards OSH (Occupational Safety and Health).	• Feedback from worker representatives; • Number of worker suggestions.
Risk management	• overall risk level; • number of risk assessments conducted; • percentage of workplaces with updated control measures.

This method is preferred by organizational leadership as it is the pathway to obtaining management system certification. However, this method is limited to analyzing the structural components of the management system.

For measuring the operational performance of the management system, the process-based approach is utilized. This approach involves measuring the individual performances of each process within the management system (such as safety policy, communication, prevention and protection plan, hazard identification and risk assessment, legal requirements,

etc.), thus indicating the overall effectiveness level of the management system.

It is observed that none of the presented approaches cover both structural and operational performances, necessitating the application of combined methods to determine the overall performance of the OHS management system.

Table 2 presents the indicators associated with the performance criteria of OHS management systems.

4. NONCONFORMITY IDENTIFICATION PROCEDURES

To ensure the proper functioning of the OSH management system, the organization should have implemented procedures for identifying current and potential nonconformities, performing remedies, and carrying out corrective and preventive actions. Nonconformities can relate to management system requirements or performance criteria.[3]

To identify workplace nonconformities, periodic inspection activities should be planned and carried out, which can take the form of routine checks, inspections, tests, measurements, and examinations. These can serve as performance indicators and may include:

– Routine checks at workplaces covering issues such as machine safety, product storage, workplace orderliness, and cleanliness, etc.;
– Monitoring workers' activities and observing adherence to OSH and work instructions;
– Special tests conducted by competent individuals to monitor: workers' health status, special authorizations (handling of lifting machines, open flame work permits, electricians, etc.), determination of noise levels at workplaces, fire extinguisher checks, etc.

The categories of records that can demonstrate compliance with requirements and constitute a database for calculating performance indicators are:

– records of compliance assessment with legal requirements and other requirements;
– information derived from the risk assessment process;
– records of osh performance monitoring;
– records of calibration and maintenance of equipment used for monitoring osh performance;
– records of corrective and preventive actions;
– reports of internal inspections regarding osh;
– reports of osh management system audits;
– reports on worker participation and consultation;
– reports on work accidents and minor incidents;
– reports on monitoring workers' health status;
– reports on the maintenance of personal protective equipment (ppe).

Measuring the performance of occupational safety and health management systems has several limitations. It has been emphasized that in management theories, the concept of audit has become suspect because measuring the number of accidents (the most common criterion/ performance indicator) does not yield statistically relevant results. Moreover, this approach provides no indication of the reasons behind the improvement or deterioration of safety in the organization.

Using past performance indicators (statistics on accidents and occupational illnesses, production time lost due to accidents, etc.) can be detrimental because they do not provide any information about the current safety status of the organization. Establishing preventive

measures based on the performance measurement phase, without precisely knowing the underlying causes of nonconformities, can introduce new risks in the workplace or create new occupational safety problems in the organization.[12]

5. CONCLUSIONS

Regardless of the size of the organization or the nature of its activities, there are no workplaces where there are no risks of accidents. The risk of accidents and occupational illnesses, in the broadest sense, is characterized by the probability and consequences of a hazard manifesting. The purpose of risk assessment is to identify hazards in the workplace and establish preventive and control measures. Risk management is the process of decision-making, considering the effects of uncertainty on achieving objectives and establishing the necessary measures and actions.[4]

The basic element of risk management is the risk assessment process, which in most risk assessment methods consists of four main stages: hazard identification, risk assessment, risk prioritization, and establishment of risk control measures.

There is a wide variety of risk analysis methods in literature and practice, stemming from different approaches or areas of applicability. One of the main limitations of these methods is their lack of transferability to different categories of work systems. Moreover, these methods do not consider the work system at a global level; rather, analyses are conducted on subsystems of the organization.[5]

Risk assessment methods can be classified based on several criteria, such as the type of input data (deterministic, probabilistic, combined) or the type of output data (qualitative and quantitative). The variety of risk assessment methods shows that although they all have the same goal, the approach to achieving it differs depending on the size, complexity of activities, and sector of activity of the organization for which they are designed.

In Romania, the most well-known and widely used risk assessment method is the one developed by the National Institute of Research and Development for Occupational Safety - "Alexandru Darabont" Institute in Bucharest. Although this method is relatively laborious, with a relatively large number of probability and severity classes, it is chosen by most risk assessors because it is versatile and can be successfully used in most organizations, regardless of their size and the nature of their activities.

The limitations of risk assessment methods are mainly related to the subjectivity of the evaluator who intervenes in determining the level of risk when establishing the probability of occurrence and severity of the consequences of a hazard. Additionally, the methods do not guarantee the identification of all undesirable events or hazards because the results depend largely on the professionalism and experience of the specialists, as well as on the inherent limitations of human capacity to imagine potential scenarios, and because the rigor of the results and the exhaustive nature are strongly influenced by the time and resources devoted to the analysis.

For the purpose of monitoring and measuring the security performance of the system, the specific data and performance indicators of the system are elements that will constitute the documentary basis of the management's analysis. On the other hand, monitoring and analyzing them will provide evidence of whether or not the goal of implementing the management system has been achieved: continuous improvement of occupational safety and health performance in companies. This approach ensures active monitoring of workplace

accident risks and constantly identifies nonconformities. Information from the nonconformity report can serve as performance indicators for the organization's occupational safety and health management system.

In conclusion, the risk assessment process, regardless of the method chosen, is the fundamental element for occupational safety and health management systems, contributing through the information provided to identifying and raising awareness of sources of danger to workers' safety, prioritizing risks, and establishing measures for preventing and controlling the risks of accidents and occupational illnesses.

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