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Work healthy and safety at work management system in the construction industry as a logistic support

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Abstract

This study aims to provide subsidy for construction entrepreneurs in the implementation of a Health and Safety Work (HSW) Management plan based on OSHAS 18001 specifications [1], the guidelines of ILO Brazil (International Labor Organization) and other legislations related to workers health and safety. The method presented here was based on national and international publications about management methods, identifying the requirements of HSW legislation and how can organizations define a schedule to implement its management. As a methodology, explanatory research was used, aiming to develop, explain and modify concepts and ideas, considering more precise problem formulations or researchable hypothesis for further studies and descriptive research, where facts are observed, registered, analyzed, classified and interpreted. The integration of a quality management system, environment, health and safety at work legislation is a reality in Brazil and a global tendency that if applied effectively in companies' daily operations, can result in continuous improvement of entrepreneurial development and satisfaction of the parts interested.

Keywords

Management. Health. Safety. Work.

1. Introduction

As a consequence of globalization, the construction industry is becoming more competitive, demanding better qualification and structure in order to guarantee better business opportunities. So companies need to have competitive strategies to have advantages over their competitors. The implementation of a Management System, based on management quality, environment, health and safety legislation at work becomes very important for the continuous improvement of any organization. The HSW (Health and Safety Work) Management System implementation, based on the OHSAS, the guidelines of ILO Brazil and other legislation related to health and safety at work, make companies more competitive and clients more confident.

Constant changes in work-related accidents legislation lead to entrepreneur's civil and criminal responsibility over workers health and safety and companies are trying to have a better management of this area. The method presented here was based on national and international publications about management methods, identifying the requirements of HSW legislation. These requirements are used as a basis for management implementation.

Companies are more and more concerned about showing a good Health and Safety at Work (HSW) performance through continuous workplace hazard analysis and its control. Thus, in the context of work legislation and other more demanding legislations, many organizations are considering to have a more efficient HSW management system. According to Santana the construction industry is considered worldwide as one of the most dangerous. ILO informs that every year, at least 60,000 fatal accidents occur in the world, with one death every ten minutes [2]. The implementation of a system that can prevent accidents and preserve workers health is a need, as it can potentially reduce the number of injuries and death caused by work-related accidents. The situation in Brazil regarding the number of accidents that still happen in construction sites, show the urgency to define goals, propose actions and plan a continuous interference in the sites to enhance the construction sites installations safety and also to create a well-established policy to mitigate the number of accidents. According to the Brazilian CAT (Report of work-related injury), between 2010 e 2011 there were 42,978 accidents [3].

2. Objective

The main objective of this study is to identify the requirements defined in the HSW specifications according to ILO, BS 8800 and OHSAS 18001 and the steps to define a plan for its implementation, aiming to facilitate the understanding and application of these directives by civil construction companies.
The most important point of this research are the requirements of OHSAS 18001 [1] which stands for Occupational Health and Safety Assessment Series; as it specifies elements of HSW Management System, helping the companies to make correct interpretation and implementation of these requirements in order to achieve a standard certification. The management procedures must be carried out considering the whole organization as a structured and integrated system.

3. Methodology applied to the research

In order to carry out this research, the knowledge acquired in construction companies' management systems was the basis of this study. This study considered professional activities, auditing in management systems in PBQP-H (Brazilian Habitat Quality and Productivity Program)/Regiment SIQ-Constructors, Service Compliance and Evaluation System and Civil Construction Companies.
The literature review considered HSW national and international data about health and safety management system at the workplace, ILO (International Labour Organization), Jorge Duprat Figueiredo de Segurança e Medicina do Trabalho Foundation (Fundacentro), specifications of OHSAS 18001 [1] and other literature references related to the subject.
The research methodology used is classified as exploratory. Gil [4] considers that the exploratory research aims to develop, explain and modify concepts and ideas, considering more precise problem formulations or researchable hypothesis for further studies.

4. Health and Safety at Work Management

4.1. Job-related accidents legislation

A healthy and safe work environment is one of the most important rights guaranteed by the Constitution of the Federative Republic of Brazil, 1988, article 7º, paragraph XXII, which requires the reduction of hazards inherent to work, through health, hygiene and safety legislation. The concern with health and safety constitutes one of the most social relevant themes of workers and government interest. In this study ten Decrees related to the theme are considered.

4.1.1 Criminal aspects of job-related accident

The Brazilian Civil Code, Article 159 determines that: "anyone that, through action or involuntary omission, negligence or carelessness, breaks the rights or causes loss to someone else is obliged to repair the damage." When the company does not establish preventive actions to keep the health and integrity of its workers and subcontractors, if considered guilty, it must compensate for the material or moral damage, as required.
It is characterized as a crime the work-related accident that occurs due to employer's negligence to observe the basic health and safety legislation at workplace. This responsibility relies on the person who is in the highest level and is able to change the situation and who had the duty to inform existing irregularities and to propose control measures. It is necessary to have a NTEP (causal connection) to attribute responsibility to companies for work-related accidents. It is the employer responsibility to adopt measures for work environment. hazards management and workers health control measures, searching available means to prevent or limit hazards and protect workers from any risk.

4.2 Accidents (Accidents and Almost-accidents)

The first term to be defined and discussed is 'accident', considering that one of the main objectives of HSW Management System is the elimination or reduction of its occurrence. The word 'accident' naturally suggests the idea of a sudden event that occurs by casualty and results in personal damage. However, this vision is inadequate and generates problems in the accident prevention field, as it brings the wrong conception that accidents are a casualty; the consequences come immediately after the accident; accidents always results in personal damage.
Brauer [5] defines accident as a simple event or a sequence of multiple undesirable and unplanned events that are caused by unsafe actions, unsafe conditions or both, and can result in undesirable effects.

4.3 Incidents (Insecure conditions and insecure acts)

According to OHSAS 18001[1], terms and definitions, an incident is an event that originates an accident or that had the potential to lead to an accident.
When adopting the prevention point of view, it can be considered as an accident cause, any factor that if not eliminated in time will lead to an accident. The importance of this concept lies on the undeniable fact that the

accidents are not inevitable and do not happen by chance, but are provoked and subject to prevention, through the knowledge and elimination, in time, of its causes.

4.4 Danger and Hazard

Danger according to OHSAS 18001[1] is the source or potential situation that provokes damage such as injury, illness, property damage, environmental damage or a combination of them.

Hazard according to the OHSAS 18001[1], is the combination of occurrence probability and consequences of a determined danger event. . Spillane and Oydele [6], in their research to identify strategies for health and safety in confined construction sites considered that an effective design of site layout prior to starting on-Site is fundamental to health and safety.

To evaluate danger and risks at the workplace, it is necessary to evaluate the organization processes, as can be observed in figure 1:

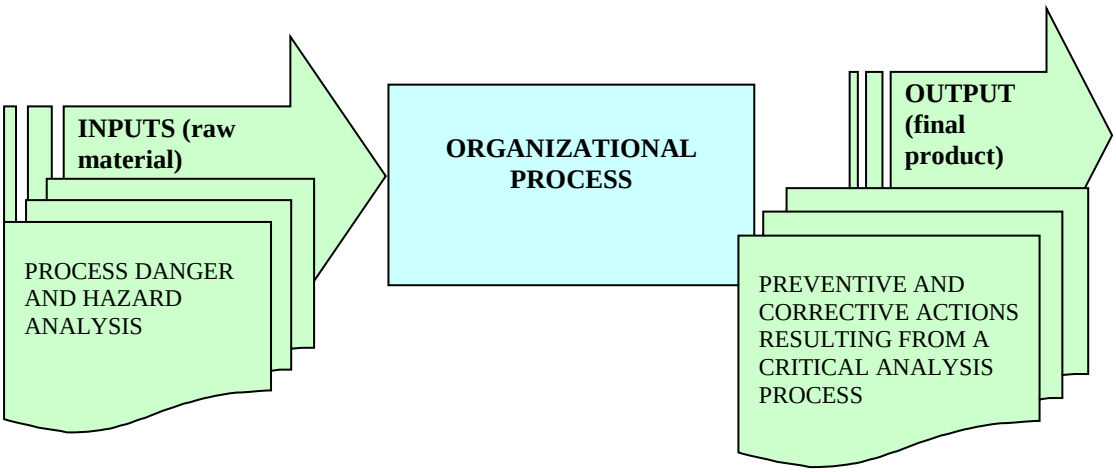

Figure 1- Organization Processes
Source: adapted from NBR ISO 9000

4.5 Concept of HSW Management System

The definitions of HSW Management System presented by ILO and OHSAS are the following: 'Set of elements interconnected or interactive aiming to establish a HSW policy and objectives and reach these objectives." (ILO – International Labour Organization / FUNDACENTRO: 2005).

> Parts of the global management system that facilitates the hazard management of HSW associated to the organizational business. This includes the organizational structure, planning activities, responsibilities, practice, procedures, processes and resources to develop, implement, reach, critically analyze and maintain the HSW policy of the organization. (OHSAS 18001[1] - Occupational Health and Safety Assessment Series).

4.6. Reference legislation for HSW Management Systems

There is an increasing concern about worker's health and the high costs of work-related accidents to public and private institutions, many countries developed specific legislation and specifications to implement a HSW Management System in organizations aiming hazards management improvement and worker's safety.

5. Management System Elements based on OHSAS:

OHSAS specifications provide requirements for an OHS Management System, allowing the organization to control its risks of accidents and occupational illnesses and improve its performance. It does not prescribe specific criteria of performance of Occupational Health and Safety, nor provides detailed specifications for the project of management system. Each company will decide the best approach to be compliant with the law and to guarantee the workers safety. There should be an Occupational Health and Safety policy within the companies, authorized by the high administration, which clearly establishes the global objectives regarding safety and health and the commitment to improve the OHS performance. Table 1 shows some aspects that should be considered,

when setting a plan to reduce the incidence of accidents, its injuries and the number of death caused in the work environment.

TABLE 1 - OHS IMPLEMENTATION MAIN OUTLINES

HEALTH AND SAFETY WORK MANAGEMENT
Know and identify procedures
Diagnose OHS requirements
Define a plan according to size and activity
Define a policy
Identify dangers and hazards
Hire a specialized company to monitor legal requirements
Define goals and objectives
Define the necessary requirements related to human resources, qualifications, materials, equipment and financial resources
Release a manual with the guidelines to health and safety actions and management control
Define duties and responsibilities of people, who manage, execute and check the activities related to hazard activities, installation and organizational process.
Document the responsibilities of those who execute and check the activities related to hazard activities, installation and organizational process.
Inform the organization workers of all levels about duties and responsibilities
Establish and keep procedures necessary to OHS policy and management compliance
Communicate workers of OHS relevant information
Create adequate procedures for documentation and data collection
Control procedures for documents and data
Control data update system
Control obsolete data removal
Establish procedures to manage and measure performance
Establish and define responsibilities and authority to investigate and treat accidents, incidents, non-compliance
Set up a plan to reduce injuries and accidents
Plan preventive and corrective actions
Implement the necessary changes in the system, when necessary
Implementation of activities tracking
Plan procedures for periodic audits
Monitor actions continuously

Source: OSHAS 18001

5.1 Planning for danger identification and hazard control and evaluation

Aenor [7] the organization should establish and keep continuous identification of danger procedures, hazard evaluation and control implementation measures. These procedures should include: routine activities and non-routine activities; including activities of every person that has access to the workplace (including subcontractors and visitors); workplace installations, both provided by the organization and by others.

The organization should ensure that the result of this evaluation and its effects control are considered when defining the OHS objectives. The organization should keep the procedures documented and the information updated according to the organizational methodology, in order to identify danger and evaluate possible hazards.

Haywood [8] considers that good standards for safety and health on a construction project start with the decision made by the client who procures the work. It is at this stage that the whole safety and health climate of a project is established.

5.2 OHS Management Plan

The organization should establish and keep an OHS management plan in order to reach its objectives. These plans should include the documentation that assigns responsibilities and authority to every and each level of the companies' employees and to different positions inside the organization, aiming to reach the objectives specified.

The OHS Management plans should be critically analyzed regularly and then changed if necessary in order to adapt to activities changes, products, services or operational conditions of the organization. [9]

5.3 Structure and responsibility

In order to facilitate OHS management, the function, responsibility and authority of the people who manage, execute and check the activities related to hazard activities, installation and organizational process are defined, documented and informed.

The high administration has a formal responsibility for the OHS plan. The organization should nominate a member from the highest administrative level, who will have a specific responsibility to ensure adequate implementation of OHS management system, its efficiency and coverage.

The administration should provide the essential resources for implementation, control and improvement of OHS management system. Nielsen [10] says that the approaches to change is primarily leader-based, as it focuses on changing supervisory practices in accordance with emphasis on the pivotal role of leaders in creating cultural and climate change.

5.3.1 Training, awareness and competence

People should be competent to develop tasks that could have an impact over OHS in the workplace, the competence to do so means proper education, training and experience. According to law, workers must be informed, instructed and consulted on health and safety. Full participation goes beyond consultation – workers and their representatives are also involved in making decisisons. Worker participation on health and safety is a simple two-way process [11].

Organizations should establish and keep procedures to ensure that its employees in every relevant level and position are aware of the importance of compliance with OHS policy, procedures and management system requirements; their responsibility and duty to respect this agreement, including the requirements of emergency assistance; the OHS consequences and benefits resulting in personal performance improvement; the potential consequences of disagreement with the operational procedures specified. [12]

5.3.2 Consultation and communication

The organization should have procedures to ensure the communication of OHS relevant information both from and to employees and other parts involved. The arrangements to involve the employees should be documented, and the parts involved should be informed.

The employees should take part in the critical analysis of policies and procedures for hazard management and in their development; be consulted when any change could affect their health and safety in the workplace; be informed about who is the OHS representative nominated by the administration. Consulting the workforce on health and safety measures is not only a legal requirement, it is an effective way to ensure that workers are committed to health and safety procedures and improvements [13].

5.3.3 Documentation

The organization should establish the management system main elements and the interaction among them, providing orientation about the documentation described. This information should be kept in paper or electronic format. The electronic format would allow to have a great amount of documentation, which can be easily tracked for the benefit of the whole corporation.

The organization should establish and keep control procedures for all documents and data demanded by OHSAS, in order to assure that they can be easily located, periodically analyzed and reviewed when necessary and that approval by authorized staff is performed. Also, the availability of updated versions of documentation and data and immediate removal of any obsolete document or data are essential to assure that the effective performance of the OHS Management system is being executed. Spillane and Oydele [6] in their research in confined sites found that where on-site management incorporates the strategies documented, reductions in accidents and incidents are achievable.

5.3.4 Emergency preparation and assistance

Establishing and keeping a plan and the possible procedures to identify potential accidents, assist emergency situations, prevent and reduce possible illnesses and injuries associated to them is the company's duty. The organization should critically analyze its plans and the procedures in case of emergency and assistance,

especially after an accident occurs. The procedures should also be periodically tested by the company, to ensure that a contingent plan of any hazard risk is applicable for different situations in a timely manner.

5.4 Monitoring and performance measurement

The organization should establish and keep procedures to periodically monitor and measure the OHS performance. These procedures should ensure: qualitative and quantitative measures suitable to the organization's needs; OHS achievements level monitoring; proactive measures of performance that control the compliance with OHS management planning requirements, with operational criteria and legislation applied; reactive performance measures to monitor accidents, illnesses, incidents (including almost accidents) and other historical evidences of OHS performance deficiency, data record measurement and results control, to facilitate the next preventive and corrective action analysis.

In the literature on the performance of safety management, there are many reports on both the implementation of framework methods of performance measurement, comprehensively covering various areas of safety management, and on the application of selected or single leading indicators, as well as their impact on the frequency of accidents or other safety outcomes. [14]. Another aspect to be considered, when measuring performance is the individual performance, which may be affected by individual or social features. So cultural and language aspects, temporary or permanent job positions and past practice may interfere in the way people work and view safety. Chen e Mills [15] exploits these aspects in his study with selected construction industries subgroups (immigrants, female, old) and found the performance was affected by discrimination atmosphere, family pressure, severe jobsite work conditions (women); physical conditions or pre-existing injuries (old); communication, living status and pressure (immigrants). The differences between subgroups make them react and act in different ways in relation to health and safety culture and management.

5.4.1 Accidents, incidents, non-conformities and preventive and corrective actions

Procedures established define responsibility and authority to investigate and treat accidents, incidents and non-compliance; adopt measures to reduce any consequences arising from them; initiate and conclude preventive and corrective actions and confirm their efficiency. These procedures should be critically analyzed during the hazard evaluation process and before their implementation. The organization should keep record of documented procedures and implement any changes, resulting from preventive and corrective actions.

5.4.2 Records and management records

The organization should establish and keep OHS identification, maintenance and discharge procedures. The OHS records should be readable and identifiable allowing the tracking of activities involved. These records should be filed, allowing their easy access and must be kept safely against damage, deterioration and loss. The retention period is established, registered and followed according to the organization system in order to show compliance with OHSAS. Tracking all the records allows constant analysis and a health and safety policy reformulation, which indicates continuous improvement.

5.4.3 Auditing

The organization should establish and keep a plan and procedures for periodic OHS management system audits. This should determine if the OHS management system is in accordance with the management plan, including the OHSAS specification requirement; if it has been properly implemented; if it is being kept and if it is efficient to meet the organization policy and objectives. It should critically analyze the prior auditing results and provide information to the administration about actual auditing results.

The auditing program including the chronogram is based on hazard evaluation results and on prior audits results.

5.4.4 Critical analysis by the administration

The organization high administration should critically analyze the OHS management system to periodically ensure its continuous adaptation and efficiency. The critical analysis process should ensure the collection of necessary information, allowing the evaluation by the administration. This systematic analysis leads to a better understanding of the basic causes of safety issues and enhances the commitment to health and safety through actions, improving safety management and safety culture. It should be documented, as shown on figure 2:

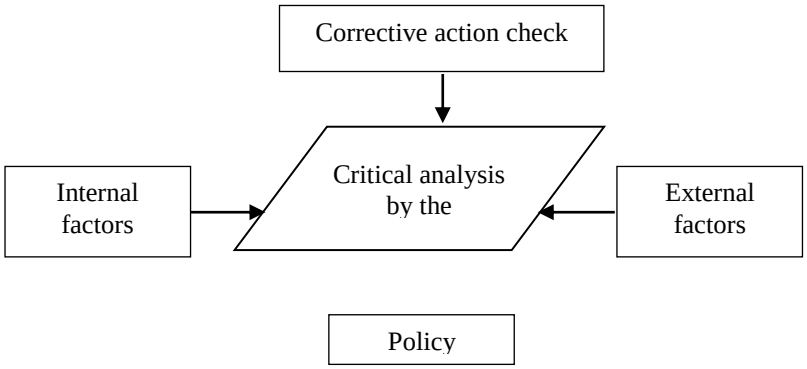

Figure 2 – Critical analysis by the administration
Source: OHSAS 18001[1]

6. Work Health and Safety Interpretation and implementation of norms requirements

6.1 General

One of the first steps towards the OHS implementation is to know and identify its procedures. After that it is important to diagnose the OHS requirements applied by the organization. The implementation plan of the legislation requirements (ILO:OHSAS, etc) will be based on this diagnosis.
Once created the diagnosis and the implementation chronogram with the definition of tasks and responsibilities, the implementation process starts. The OHS management system manual is created, describing the schedule of legislation requirements and how each of them will be organized.
The inputs and outputs of this process can be tangibles or intangibles, ex: equipments, material, components, energy, information, financial resources, among others.

6.2 OHS Policy

The organization should define an OHS policy adequate to its size and activity. It is recommended that the highest administrative levels establish a single policy that complies with all the legislation requirements. It is based on the corporative policy, nature, size, activity aspects, services and products, legal requirements, possible hazards and other requirements, if applicable. Commitment with continuous improvement is necessary.
The Vision Statement defines an image of the future the high direction seeks to create while the Mission Statement articulates the company's purpose both for those in the organization and for the public. [16]
The Company Policy reflects its intentions and global directives and should consider its strategic situation regarding the market and competitors.

6.3 Planning

6.3.1 Danger identification planning and Hazard evaluation and control

In order to identify and evaluate the OHS dangers and hazards, all danger related to work activity and installations should be identified and determined through the existing management. The need to adopt or implement a new management system is assessed.

6.3.2 Legal requirements and other requirements

For legislation control, a specialized company may be hired to identify and monitor legal requirements applicable to the activities, products and services. This company provides legal and technical texts interpretation, updates information, performs analysis, monitors and controls requirements compliance. Besides monitoring it gives advice during internal audits or audit certification or during the application of legal requirements or other requirements applicable; it keeps documented evidence of its assistance (documents, records, data, spreadsheet, drawings, licenses, register, declaration, enrollment, photos). The organization also should monitor these requirements, making the necessary update and recording all the necessary data.

6.3.3 Objectives and targets

In order to create a good practice guideline for objectives and goals definition, it is recommended to adopt a computer system to set up and control objectives, set goals and performance indicators aiming to check its effectiveness and enabling so preventive and corrective actions; observe if objectives and goals are compatible with the strategic plan, policy and directives, processes, activities, products and services and the company interests and also check if objectives and goals are continuously bringing improvement to the processes and the organization as a whole. OHS objectives table should be created by the management committee together with the high administration. The objectives are established considering, when available, the company historical data such as absence and number of accident layoff, type of injury layoff and accident without layoff. The table should include the objective, performance indicator, performance measurement unit, where and how to obtain data, who is responsible for data gathering and the frequency of data gathering. The performance indicator is important to control the fulfilment of the objectives. [17]

6.3.4 OHS Management plan

In order to create a management plan procedure it is recommended to establish plans related to objectives and goals and define the methods, human resources, qualifications, technologies, materials, equipment and financial resources in an agreement between the high administration, execution staff and suppliers; it is also recommended to grant promotions and variable remuneration to employees and managers; adopt legal and strategic plans for Environmental Hazard Prevention Plan, Occupational Health Medical Control Plan, Work Environment Control Program.

6.4 Implementation and Operation

6.4.1 Structure and Responsibility

In order to create a good practice guideline it is recommended to set up a legal procedure regarding responsibilities and duties management, staff, suppliers, customers, safety and medicine at work responsible, accident prevention internal committee, etc; inform these responsibilities through internal normative, training, intranet, etc; achieve the leaders commitment and its involvement with OHS management system; assign human and financial resources in order to improve the management system and process performance. [18]

6.4.2 Training, awareness and competence

In order to create a good practice guideline it is recommended to establish standard training to meet legal requirements, awareness and competences; certification criteria for staff and for maintenance and inspection, considering training in the areas of Quality, Safety, Health and Environment; contractual demands allowing lectures regarding Safety integration, Health and Environment and other necessary topics are also recommended.

6.4.3 Documentation

In order to create a good practice guideline it is highly recommended to establish the OHS management system Manual with hyperlinks to its main applicative, documents, data and records and spread it through workshops and intranet. The manual should comply with the legislation requirements identifying how the organization follows these requirements. Therefore, manuals bring legislation description and how the company defines its actions aiming to meet each requirement. It is not only a priority to plan the whole health and safety plan, but to communicate to workers what are the necessary guidelines to conduct the process and procedures.

6.4.4 Documents and data control

In order to create a procedure to control documents and data it is recommended to adopt a computer system to control the documents and data and facilitate its immediate location; adopt changes and update control measures; adopt information safety procedures; improve installations and storage of documents, data and backups; properly identify documents kept for legal reasons or know-how and immediately remove them when obsoletes.
The legislation aims to keep the important data safe through time, to guarantee its integrity, availability and easy access for those who need to perform tasks in the organization.

6.4.5 Operational control

In order to create a good practice guideline it is recommended to create an operational procedure (job instructions) based on previous hazard analysis and legal requirements related; develop corporative norms created by the team representing all departments, considering legal requirements and previous experiences in the organization; identify activities and operations in need of measurement control.

6.4.6 Emergency preparation and assistance

In order to create an emergency assistance procedure it is recommended to identify emergency scenarios and estimate its consequences based on qualitative and quantitative techniques involving, for example, the use of applications to simulate assistance for people wounded in explosions, fires, and their transference to hospitals or health units; set up emergency procedures considering equipment, facilities and accident scenarios based on hazard analysis studies, consequence simulations, legal requirements, and recommendations resulting from real emergencies and simulations performed; implementing an emergency center with specialized teams. [19]

6.4.7 Verification and Corrective action

6.4.7.1 Performance measurement and monitoring

This procedure is important to ensure the process development.

In order to create this procedure it is recommended to hire a company specialized in monitoring occupational health and safety; monitor the compliance with operational procedures, legal requirements and other applicable requirements; monitor the compliance and efficiency of objectives, goals, plans, training, communication, preventive and corrective actions.

6.4.7.2 Accidents, incidents, non-conformity and preventive and corrective action

Some factors are considered to be important for the OHS management performance, such as informing employees about how to make non-compliance reports and perform preventive and corrective actions. Wrong data and information could directly influence decisions taken by Engineering in Medicine and Health Division.

In order to create a good practice guideline it is recommended to adopt accident occurrence management measure (accident, incident and non-compliance) that can be accessed by various organization units; analyze the occurrence coverage; treat the preventive and corrective actions according to the occurrence potential and gravity and monitor them; provide specialized trainings in accidents and non-compliance analysis and investigation techniques. [20]

6.4.7.3 Record Control

In order to create a record control procedure it is recommended to adopt a computer system for record control; adopt legal procedures for record storage; observe information safety procedures, use of backups and installation improvements.

This implementation requires a documented procedure in order to define the necessary controls for identification, storage, protection, recuperation, retention time and discharge. As it was mentioned data gathering and data control are important and to have easy access to all this is essential to get better results, having past issues as lessons learned.

6.4.7.4 Auditing

In order to create an environmental or quality management system auditing procedure (NBR ISO 19011) [10] it is necessary to perform audits in order to verify the system compliance with management system legislation requirements; train internal auditors to search for necessary evidence in order to evaluate the organization OHS management system.

In order to perform the auditing, the auditors can use of a check-list with the applicable legislation requirements to facilitate their job. At the end of it, an Auditing Report should be completed considering: conclusions, non-compliance, observations, improvement opportunities, positive and negative findings.

6.4.8 Critical Analysis by the administration

In order to create a good practice guideline it is recommended to execute critical analysis at least once a year, critical analysis based on indicators results; monitoring of preventive and corrective actions, internal auditing; review of management system procedures, customers complaints (internal and external factor), non-conformity of system, material and service suppliers evaluation; analysis of customer service; preventive and corrective critical analysis and continuous improvement vision; actions plan with scheduled time and responsibility.

The administration critical analysis should be recorded and this record must be kept in order to show evidences for the high administration participation on the monitoring and problem solving related to health and safety at work. [21]

7. Final considerations

This work aims to be another consultation tool for OHS Management system implementation. It is important for companies which intend to implement an OHS Management system to have the necessary competency to guide and facilitate the process always in compliance with OHSAS 18001 requirements.

The integration between the management quality system, environment and health and safety at work legislation is a reality in Brazil and a global tendency. This integration will result in continuous business performance improvement and satisfaction of all the actors involved in this whole process.

All over the world new legislation is increasing the awareness of companies and workers for the guidelines to be followed by them to have a safe site. A safety culture is a subset of, and clearly influenced by, organizational culture. Organizations often have multiple cultures or subcultures, and this may be particularly true in construction [23]. Consider the multiple construction scenarios, where health and safety management systems are implanted, may help to create elements for cooperation and would bring a more concrete detailed data and a larger view of the poblems faced in this scenarios to manage health and safety not only as a site problem, but also as a public health problem

Although the implementation of OHS management system can help to develop a better culture of health and safety and brings the possibility to achieve the goals established in relation to them, different authors consider that there are other crucial points that must be considered when taking into consideration health and safety. The implementation of a well developed plan, that considers all the steps presented here is not enough if the personal and social environment are not considered. Some of the aspects raised by OIT/ European Agency for Safety and Health at Work and ILO are lack of specialized employees, which makes the compliance to the legislation more difficult; lack of use of protection equipment, although it is essential to workers safety; lack of communication effectiveness to share view and information that would bring a more appropriate conduction of the health and safety management systems, as the workers at all levels must ensure the effective practice of the guidelines.

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