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FUNCTIONS, RESPONSIBILITY, AND AUTHORITY OF HUMAN RESOURCES IN THE IMPLEMENTATION OF A SECURITY AND SAFETY MANAGEMENT SYSTEM AT WORK

FUNCIONES, RESPONSABILIDAD Y AUTORIDAD DE LOS RECURSOS HUMANOS EN LA IMPLEMENTACIÓN DE UN SISTEMA DE GESTIÓN DE LA SEGURIDAD Y SALUD EN EL TRABAJO

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ABSTRACT: A security and safety management system at work must fulfill a number of general and particular requirements that allow one to promote good practices in order to achieve the objectives of the policy approved by the organization. Risk assessment and control is not an easy task; it requires significant material and human resources. In the implementation and operation of a management system the human resources devoted exclusively to security and safety at work play an essential role. It is necessary to establish the organization chart of these resources and to define the functions and responsibilities of each of the areas composing the Security and Safety Service of the company that are not detailed in the known standards. In this work, based on the knowledge of preventive techniques, the structure of a complex prevention service is described. This structure can be used as a practical model.

KEY WORDS: Management, safety, health

RESUMEN: Un sistema de gestión de la seguridad y salud en el trabajo, necesita cumplir con unos requisitos generales y particulares, que permitan promover una serie de buenas prácticas para lograr los objetivos de la política aprobada por la organización. La evaluación y control de los riesgos no es tarea fácil y necesita de unos medios materiales y humanos importantes. En la implementación y operación del sistema de gestión, juegan un papel fundamental los recursos humanos dedicados en exclusiva a la seguridad y salud en el trabajo. Es necesario establecer el organigrama de estos recursos y definir las funciones y responsabilidades en cada una de las áreas que componen el Servicio de Seguridad y Salud de la Empresa, que los estándares conocidos no detallan. En este artículo, partiendo del conocimiento de las técnicas preventivas, hemos descrito la estructura de un servicio de prevención complejo, que podrá tomarse como modelo práctico.

PALABRAS CLAVE: Gestión, seguridad, salud

1. INTRODUCTION

Occupational health and safety management standards should be an efficient tool for fulfilling the objectives formally expressed by top management in a company. In this sense, the Health and Safety Management System 18001 OHSAS 18001:2007 [1], in its planning section, states that the procedures for identifying and assessing risks must take into account issues such as infrastructure, equipment, and necessary material in the workplace. It also says that the organisation must set up, implement, and maintain programmes to reach desired targets. To this end, responsibilities need to be assigned and authority delegated at various levels of the organisation.

Implementing an occupational health and safety management system in the workplace requires

sufficient material and human resources with appropriate skills. Moreover, roles at every single level of the preventive organisation need to be defined. Nevertheless, standards do not go any further. Terms such as *sufficient*, *necessary*, or *apt* are not specific enough. In a first approximation, it could be said that employers, either by obligation or personal conviction, must adopt the necessary measures to ensure that their employees are protected and their general health maintained. Following [2–4], measures will be taken according on general principles for effective occupational risk prevention: avoid risks; assess unavoidable risks; address risks from their origin; adapt the task to fit the individual; bear in mind technological advances; replace hazardous elements with lower risk or danger-free elements; plan occupational risk prevention as a logical unit which integrates technology, work organisation and conditions, social relationships, and environmental working factors; adopt measures that put protecting the whole staff before the individual; and finally, give appropriate instructions to employees. In order to fulfil these objectives, the employer must have an occupational risk prevention service with a reasonable number of staff members who all have the necessary skills and abilities as well as resources. They must also be able to allocate time on a sufficient scale to deal with the company's risks [5,6]. Another point to take into account is the professional health and safety skills staff members need to do their assigned tasks. It should be guaranteed that only workers who have undergone appropriate training have access to specific high-risk areas. There must also be effective preventive measures, in case an employee is distracted or reckless.

According to health and safety objectives, the occupational risk prevention service will consist of an interdisciplinary team with a good number of well-trained staff to develop necessary preventive activities [5–6]. This interdisciplinary team will consist of technical and medical personnel. One cannot forget that the success or failure of a mission lies in team work. In occupational health and safety risk prevention, both the technical and medical teams must work in close collaboration, and staff numbers should meet the needs of the company. What is more, in companies with a strong commitment to health and safety, together with national and international official organisations in the developed world that work in this field, concepts such as quality, safety, and environment must go hand in hand and function as a single unit. This is because these concepts share a theoretical base: they start from top management; they are mainly anchored on preventive as opposed to corrective action; they need to be applied to all the different stages of product life and the production process; they can be measured; they are everybody's responsibility; and they can be fulfilled through the necessary training. Moreover, neither field is more important than the other one. Improving work conditions positively enhances quality and, consequently, leads to greater competitiveness in the company.

2. OCCUPATIONAL RISK PREVENTION STRATEGIES

Among work related maladies, work accidents and professional illnesses stand out most. However, fatigue, early ageing, dissatisfaction, and others should also be mentioned. Technically, work-related accidents should be understood as any undesired alteration in the development of the production process. They interrupt the continuity of work and can harm employees, objects, or the environment. A professional illness is defined as an organic or functional alteration with a three-stage evolution: the alteration itself, without symptoms and reversible on initial exposure to contaminants; the affected state, which has specific symptoms and is not fully reversible when exposure to the contaminant ends; and the illness**,** with permanent consequences. The fundamental differences between work accidents and professional illnesses lie in the way in which they are produced, the causal agent, and the type of damage caused. Thus, work accidents usually happen in a sudden way. They are normally due to a physical agent; traumas; or damage to equipment, installations, and buildings. On the other hand, professional illnesses, according to medical, non-legal criteria, will take place after the worker has been exposed to physical, chemical, or biological as well as psychological or social environmental factors. Their effects often last a long time, resulting in organic or functional alterations.

It can be seen that, in a human work environment system, it is desirable to eliminate any risk situation. Because of technical, economic, and other difficulties, this is not possible and we have to conform to more or less reasonable standards. In any case, in order to act upon risk situations, it is necessary to carry out a risk assessment (identification, estimation, and evaluation) and risk control by implementing measures to prevent risk and protect employees [7]. At any stage, one or several methods will be used. These are well known to risk prevention officers and the technical expert in a company or sector.

One could also talk about analysing safety systems, which is a line of work within the area of loss prevention. It makes it possible to solve risk prevention-related problems in a logical and systematic way. A cause-effect methodology is employed to gather data on the behaviour of subsystems within the system under revision or analysis. Some of the best known and most widely used methods are the following:

- Fine, Willian T. "Mathematical Evaluations for Controlling Hazards"
- Failure Modes Effects and Criticality Analysis (FMECA)
- Hazard Analysis and Operability (HAZOP)
- DOW and MOND Indexes for toxic and inflammable material

Risk prevention can be defined as both the scientific knowledge and technological resources that, when applied to the risk factor, eliminate or control its evolution. Protection from risk embraces both scientific knowledge and technological resources. Once applied to the occupational hazard situation, it impedes or reduces damage to individuals or material equipment. Both risk prevention and strategies that provide risk protection will have an impact on so-called *technical factors*. These factors are the elements and installations that workers use to carry out their productive tasks, with all the limitations that the different risk situations may cause. These strategies will also influence human factors, which refer to the workers themselves, with all their shortcomings, which, in turn, may cause risk situations. Table 1 summarises these strategies and the factors upon which they act. It must be said that, on the whole, when strategies and performance are compared, risk prevention strategies are more effective than the ones providing protection from risk. Working tools used at initial stages are more effective, less costly, and easier to implement than corrective measures. Technical concerns should take priority, but one should also act upon the human factor.

3. ORGANISATIONAL INFRASTRUCTURE, FUNCTIONS AND SPECIFIC AUTHORITY IN HEALTH AND SAFETY

The scale and efficiency of an occupational risk prevention management system will depend on the demands imposed by legislation, the conscientiousness and interest of the employer, and pressure from the trade unions. All of these vary a great deal from country to country and even within the same company over time. Depending on how employees seek consultation and participation, the occupational risk prevention management system will include different aspects. Other influential factors are how risk prevention issues are integrated within the company's organisational system and the way in which specialised resources in the risk prevention field are organised. Planning risk prevention activities will need a certain organisational structure as well as material resources, depending on the company's size and the existing risks in its activity. As for human resources specialised in occupational risk prevention management, European Union regulations may be followed. Companies with over 500 employees must have their own risk prevention service. This limit drops to over 250 if the activity is especially dangerous according to a reference scale. Otherwise, the company can hire an external risk prevention service that will develop all specialised risk prevention activities [5–6].

Table 1. Strategies and factors strategies act upon

		FACTORS THEY ACT UPON	
		TECHNICAL OR ENVIRONMENTAL FACTOR	HUMAN FACTOR
STRATEGIES	PREVENTION	- Safety at work - Industrial hygiene - Ergonomics - Preventive occupational psycho sociology	- Safety at work - Industrial hygiene - Ergonomics - Preventive medicine - Preventive occupational psychology
	PROTECTION	- Safety at work - Industrial hygiene	- Individual protective clothing and equipment - Life saving and first aid
	IMPROVEMENT	- Ergonomics	- Health education
	RECOVERY		- Medical assistance - Rehabilitation - Return to work

A risk prevention service in a big company places the highest demand on work management and health conditions. Its planning requires a detailed programme of activities in relation to stated objectives; these are to be developed by the risk prevention service. In the standard regulations of risk prevention management systems, there is no specification about the type of organisational model and its activities. Therefore, it would be extremely useful to have a model showing highly developed and complex structures. Such a model will describe the functions, authority, and responsibility of the managers for each of the occupational health and safety areas, as well as their representational bodies. This model will serve as a benchmark.

3.1. Representational bodies in which union representatives can participate and seek information

Company management, individual departments, the risk prevention service, and union representatives must have regular meetings to boost participation and access to information, as well as to improve working conditions. Playing a key role in this participation and improvement is the Central Health and Safety Committee, whose president will be a company director or top-level delegate. On this committee, the most important decisions about risk prevention management and the occupational risk prevention procedure manual content will be taken [8]. The Delegate Commissions on Safety and Medical Assistance; Hygiene and Preventive Medicine and Physiology, Ergonomics and Clothing will depend on the Central Health and Safety Committee.

3.2. The occupational health and safety area

The Risk Prevention Head is responsible for technical areas (safety, hygiene, ergonomics, and fire-fighting) and the medical area (preventive medicine and medical assistance). He or she will be the person with the greatest responsibility in managing risk prevention; that is to say: planning, organising, executing, and monitoring. This person will work in line with the policy established by the employer or agreed upon in the bodies for worker participation mentioned in Section 3.1. This head is the company's spokesperson when such bodies address general issues affecting health and safety conditions in the workplace. He or she is a member of the Central Health and Safety Committee and acts as a mediator with the central or local government when dealing with safety, hygiene, fire-fighting, work-related medicine, and emergency plans.

3.3. Safety, hygiene, ergonomics, and fire-fighting

The head of this area is responsible for managing the preventive policy for:

- Avoiding work accidents (safety at work and facility safety)
- Avoiding and controlling fires (fire-fighting)
- Avoiding professional illnesses (industrial hygiene)
- Designing the workplace and analysing individual's tasks and the role of workers themselves (ergonomics)
- Stating the characteristics of the company, individuals, and organisational structure by looking at job-related factors including stress, psychological exhaustion, mobbing, and dysfunctions.
- Informing and training employees and their representatives about the existing risks in the company (training)
- Selecting individual protective equipment (clothing)

A further task is to coordinate how the workers under his or her responsibility liaise with medical services and the different departments in the company. He or she will be a member of the Central Health and Safety Committee and its delegate commissions.

Within the area of safety, particular attention should be paid to the areas of safety at work and facility safety. The former term deals with legislation for improving health and safety conditions in the workplace. Its work is immediate or short-term; its role is to give advice and support to the production line. In this way, any risk situations can be rectified instantly or in the shortest time possible. This area deals with the day to day in work-related accident prevention. Its role is based on in-house work procedures. On the other hand, the latter term has to do with legislation on product safety: the safety of work teams and company installations. Advances in legislation from this field make it necessary to compile, classify, and order the relevant documentation. Moreover, recommendations must be made to the production line and floor and maintenance

services so that the company's installations meet the new legislation. Work-related accidents are prevented and company policy goes beyond just following regulations. The work of the area of facility safety is medium to long term, covering the areas of design and control. Therefore, it will involve administrative and obligatory regulations as well as the norms and technical regulations of public or private organisations that improve the safety of equipment, installations, and buildings. A crucial factor is the way in which state organisations regularly inspect certain installations and equipment in accordance with government regulations. This area also includes all elements and equipment for which company regulations deal with regular inspections.

Fires have a terrible impact on buildings, installations and the environment. Fire- fighting therefore plays a fundamental role in a company's risk prevention policy. It entails a bit of everything and can be immediate and one-off or preventive as far as the long term service for jobs that involve a high risk of fire. It provides a medium- and long-term preventive service in the design and maintenance of installations with active and passive protection against fire. Also included under this heading is the theoretical information or practical training given to employees; any collaboration and co-ordination with external organisations; and finally, the services related to emergency planning issues.

Industrial hygiene is has to do with preventing professional illnesses in the broader sense. The American Industrial Hygiene Association (AIHA) defines it as "the science and art devoted to the identifying, assessing and controlling all those environmental factors or tensions originating in or caused by the workplace and that may result in illness, may damage health and well-being or create significant discomfort among employees or citizens of the community."

Industrial hygiene branches out in four directions: theoretical hygiene, field hygiene, analytical hygiene, and operational hygiene. It is therefore a complex, broad, and technical area of risk prevention. This area's work is mainly medium and long term, identifying, assessing, and managing risk in installations and existing processes. Its work documentation and metrology is broad, reflecting the variety of physical, chemical, and biological agents that may exist in the company.

Ergonomics has to do with workplace design, including its anthropomorphic and geometric design; ergonomic design of data visualisation screens; environmental comfort; visual ergonomics and acoustic comfort; an analysis of the individual's task in terms of physical and psychological workload, and a study of the individual as far as human characteristics and behavioural patterns. Applied psycho-sociology studies a company's features, its organisational structure, the employees' individual characteristics, different task-related factors, stress, psychological exhaustion, mobbing, and dysfunctions.

Regulations manage and control equipment for individual protection. There are also agreements made by the Commission on Physiology, Ergonomics, and Clothing that have to be regularly updated. Employees and their representatives will be informed about the measures they need to take when using this equipment. Staff training must be programmed with regular courses designed according to the existing risks in individual jobs and the work environment.

3.4. Work-related medicine

Nowadays, there is a consensus on moving away from the work-related medicine dictated by legislation towards company medicine. The latter is linked to technological advances and modern concepts of social welfare. Various factors come into play:

- The role of the company doctor is mainly preventive.
- Identifying, assessing, and monitoring existing pollutants in the work environment are the Industrial Hygiene Officer's jobs.
- Traditional work-related pathology has become outdated. On one hand, dangerous products have been prohibited, substituted, or limited in the work environment. On the other, work conditions have been improved. Thus, it is essential to find and monitor unspecific pathologies.
- As employees become more aware, they create greater demands for global health.
- Employees' demands and an improvement in their job performance are strong enough reasons to design, agree upon, and implement a preventive programme to detect, monitor on a regular basis, rehabilitate, and treat specific and unspecified

pathologies experienced by the company staff. This programme should include: occupational toxicology, cardiovascular diseases, sensory impairments, early cancer detection, vaccinations, work overload-related illnesses, drug-related illnesses, control of absenteeism, and occupational epidemiological studies.

The head of this area is responsible for managing medical policy within the company. He or she will co-ordinate services together with the colleagues responsible for safety, hygiene, and fire-fighting and the different departments of the company. There will be two main lines of work: preventive medicine and medical assistance.

Preventive medicine deals with the planning and control of: routine check-ups; specific check-ups [9]; various medical check-ups (new hospital admissions, return to work, change of position); an analysis of work posts; consultation on both prevention and declaration of existing professional illnesses; analysis, treatment, and prevention of drug-related illnesses; diagnosis of and therapy for psychosomatic illnesses; vaccination campaigns; early detection of prostate and breast cancer; and a control of sick leave.

Medical Assistance is responsible for the planning and control of: the emergency area (emergency room, ambulances, fire drills, and evacuations); the treatment area (the treatment room, its instruments and medication, emergency treatment); control of accident-related sick leave; and the rehabilitation and physiotherapy areas (rehab and physiotherapy room, equipment, and materials, rehab programmes). In a big company, it is very important to have the support of the laboratory and pharmacy, a section in charge of the planning, performing, and monitoring of clinical and drug-related tests; sampling organic fluids for drug related-tests; studying and improving analytical techniques; performing quality control programmes; filing results; running the pharmacy (medicines and first-aid kits up to date); monitoring microbiology (microbiological analysis of bathrooms and toilets); and overseeing insect and pest-control programmes in the company.

The relationship between industrial hygiene and work-related medicine is very important. Among existing environmental factors in the workplace, chemical pollutants have to be kept in mind. They can be passed via oral, respiratory, topical, or parenteral routes, the respiratory route being the most common and significant one. Logically, the employee who is exposed to a chemical contaminant is at risk. This can harm his or her health. This injury is directly proportional to the concentration of the contaminant in the work environment. Therefore, the risk will go down when the concentration is also decreased. This is so because human factors (intrinsic and extrinsic), product toxicity, the absorption speed of the toxic element into the body, and the maximum exposure time to the contaminant are all fixed parameters and can be seen as constant.

There are measures related to employee health when workers have been exposed to chemical contaminants:

- Environmental control (by means of industrial hygiene)
- Biological control (by means of occupational toxicology)
- Medical supervision (by means of preventive medicine)

Environmental control consists of studying hygiene in the work post (field hygiene), determining existing contaminants in quantitative and qualitative terms, and comparing the resulting values with compulsory standards (theoretical hygiene). In this way, it is possible to know whether an employee has been directly exposed to a certain chemical. Biological controls make it possible to determine and measure the exposure of an employee to a certain chemical in an indirect way. This can be done by analysing and measuring its presence or metabolites, in tissue, secretions, excretion, or exhaled air, having the biological limit values (BLVs) as a reference. Thus one can find out if an employee has been exposed to a pollutant. If this is the case, it can cause an organic or functional alteration which will have a negative effect on that person's future health.

Specific medical check-ups which follow a protocol especially designed for every profession [9] help to detect an employee's illness caused by chemical exposure. If operational hygiene control methods are not used to reduce chemical concentration levels in the environment to values that are harmless to health, the employee will get sick. It is therefore essential that experts from different areas in risk prevention work together and complement

each other in order to relate acceptable degrees of exposure to acceptable health standards.

The relationship between facility safety and floor and maintenance work is also worth noting. This is ensured through preventive maintenance work. Maintaining installations, machinery, and equipment means they will work well. Necessary safety conditions will be in place and guarantee their operation during a given time. A good preventive maintenance policy contributes to increased safety levels, economic savings, and the quality control of the products. Regular maintenance work should be made compulsory in industrial regulations. This work should be inspected periodically by the administration and be specified in the instruction manual for machinery. Maintenance staff must be properly trained and be aware of how important their work is. With risk management, the insurance companies must not have a merely passive role; they need to encourage greater plant safety.

4. CONCLUSIONS

An occupational health and safety management system makes it possible to plan, organise, and monitor the company's set goals by using the resources that the company has available for this purpose. Risk prevention management must be integrated into the company's global management system [10] by means of the risk prevention plan. This document lists all the activities that have been ordered, approved, and accepted, and are necessary to meet the company's goals in health and safety matters. Assessing risk and planning for preventive action are the main instruments in risk prevention management. The company's risk prevention plan will specify the organisational model and chosen modality, with the allocation of human, technical, and material resources to carry out set goals successfully. These goals will depend on the company's size and the degree of danger of existing risks.

The procedures to carry out preventive action must answer the following questions in writing: What must be done? How will it be done? When will it be done? Who will do it? If the organisational structure adequately responds to these questions, set objectives will be met. Otherwise, the risk prevention organisation will be incapable of achieving the best possible health and safety conditions in a company.

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