



IMPLEMENTATION OF ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT SYSTEM (EHSMS) IN TEA PACKING INDUSTRIES

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ABSTRACT

Safety Management System is a proactive and systematic approach to the identification, evaluation, mitigation, prevention and control of hazards that could occur as a result of failures in process procedures and equipment. Increased industrial accidents, loss of lives and properties, public scrutiny, stationery requirement, aging facilities and intense industrial process, all contribute to a growing need for safety management programs to ensure safety and risk management. The ILO (International Labour Organization) constitution stipulates that workers should be protected from sickness, diseases and injuries arising from their employment. The economic development of any nation depends primarily on the important role played by industries which help in the process of export-led industrialization in the developing world. Small- and medium enterprises do not follow legislations and have no safety training programs that are conducted to ensure the awareness of safe working procedures in industry. The code of practice on safety management system will be very useful for industries in order to eliminate hazards and to provide safe work environment to the employees. The EHSMS shall be enhanced in all the above industries for protecting workers, staff and management staff as well as protecting the society at large.

Key-words: Safety Management, Risk, ILO, Security, Hazards.

1. INTRODUCTION

In today's hazardous industrial organization, safety is of prime importance (Akyuz and Cedik, 2014) as a failure of such systems may have wide devastating consequences for worker's safety and the society in which such organizations are located (Reiman, 2007). Since the beginning of the present century, psychologists, sociologists and industrial engineers have been playing a major role in addressing employee safety and health problems at work and in advising on how to achieve safe and reliable operations in the industrial organization (Azadh et al., 2012; Battaglia et al., 2015).

The terminologies relevant to environmental, health, safety management system need to be briefed in order to understand the arising discussion on the current subject of the thesis. The term "safety" refers to the control of recognized hazards to achieve an acceptable level of risk. The term "environment" refers to work place. Nowadays, the incorporation of environmental sustainability issues into organizational-wide programs has been one of the most prominent success stories worldwide among the organizational researchers. With success stories largely documented in the quality area, and with a promise of success in the safety area, the current researcher finds it potentially rewarding to invest into the integration of environmental management system with the safety and health system to obtain environmental, health safety and management system (EHSMS) currently being pursued in the current thesis.

2. LITERATURE REVIEW

In 1920, Heinrich proposed a theory of accident causation known as “**DOMINOS THEORY**” based on the examination of thousands of insurance records of industrial accidents. He was the first comprehensive effort by anyone to explain the industrial phenomena scientifically. Before Heinrich, people believed that industrial accidents were a matter of fate. In his first book, *Industrial Accident Prevention*, published in 1931, Heinrich conceptualized a domino theory of accident caution which states that injuries are caused by accidents, unsafe act and unsafe conditions cause accidents, Unsafe acts and conditions are caused by the faults of persons, Faults of persons are caused by the social environment and ancestry. Heinrich attempted to show that removing any one of these four dominos in the sequence could interpret the accident sequence. Furthermore, He stated that the bull’s eye of the accident prevention target was the unsafe act of a person or a mechanical or physical hazard. Many researchers felt that Heinrich’s theory attributed too much cause to factors internal to workers and neglected the importance of external factors. In 1973, Frank E. Bird, a researcher with the International Loss Control Institute, revised Heinrich Domino Theory (Bird & O Shell, 1973). Bird’s model was a simple revision, but it was an important insight, because it introduced the thought of managerial error into the accident causation sequence. Bird’s updated Domino theory was not widely accepted by the industrial managers as Heinrich’s model, probably because Heinrich let them off the hook. Blaming workers is easier and less costly than training workers, changing how an operation is performed or making environment modifications. Bird’s updated Domino theory states that injuries are caused by accidents. For every accident there are immediate causes that are related to operational errors, operational errors are not only symptoms of deeper underlying or basic causes related to management errors, the absence of a system of effective control permits the existence of the factors referred to as basic causes.

Reville (1980) studied the safety training methods in industries and suggested the following as the requirements of any safety and health training: First aid and emergency procedures should be done. Hazardous conditions and practices should be reported. Methods of avoiding hazardous job should be undertaken, procedures, precautions, safeguards and personal protective equipment’s necessary to protect the workers from hazardous of job.

Dawson & Stevens (1983) studied the safety programs of eight petrochemical facilities in Great Britain. They proposed a safety management model designed around technical controls and motivational controls. They defined technical controls as those employed against specific hazards. They might involve modifying physical or technical characteristics of the working environment; modifying specifying behavioral patterns of individuals, or restructuring the way workers and the environment interact.

The World Health Organization (1997) estimated that 10 to 30 % of workers in developed countries up to 30% of workers in developing countries are exposed to physical hazards, and found that accidents in industries can be reduced by 50% with the adoption of safety system, changes in behavioral and management practices. It has also estimated that 250 million occupational injuries and 3, 30,000 fatalities occur each year.

The Safety Management (1997) reported that one in four work-place deaths in England are the result of a fall from height. National Occupational Health and Safety Commission, Australia (1997) estimated that around 2900 work-related fatalities occur in Australia, each year.

Tolley (1997) found that two-fifth of all major injuries is caused by falls from a height and it is the most common cause of fatality for workers. The National Occupational Health and Society Commission, Australia (2000) reported that the percentage of deaths due to fall from height is 12 % of all fatal accidents and 60 % of the fall are involved with a height of five meters or less between 1982 to 1989 in Australia.

3. ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT SYSTEM

3.1 BRIEF DESCRIPTION OF EHSMS

3.1.1 OCCUPATIONAL SAFETY & HEALTH POLICY

The organization’s top management shall define, document, endorse and review its OH&S policy which is appropriate to the nature, scale and the hazards and risk of its activities. The top management shall ensure that the policy includes a commitment to:

- Recognizing OH&S as an integral part of its business performance. Achieving continual improvement in its OH&S performance, with commitment to compliance of relevant legal requirement and to other requirements to which the organization subscribes, as the minimum to ensure safety at work.

- Setting, reviewing and publishing of OH&S objectives and targets even if only by internal notification.

- Place management of OH&S as a prime responsibility of the organization.

Ensure its communication, understanding and maintenance at all levels in the organization.

Ensure that employees at all levels receive appropriate training and are competent to carry out their duties and responsibilities, and To provide adequate and appropriate resources to implement the policy, communicate the policy to all its employees and to make it available to public.

The organization should have a health and safety policy. It should also cover corporate safety policy. The safety officer should sign the health and safety policy and should prepare as per guidelines of the statutory provisions. The safety policy should be updated once in six months and should be made known to all. It should be scrutinized by outside expert agency and it should be mentioned in the annual report.

Performance Objectives: The organization will develop and implement an integrated, comprehensive SMS for its entire organization and will incorporate a procedure to identify and maintain compliance with current safety-related legal, regulatory, and statutory requirements.

General Design Expectations: Safety management will be included in the complete scope and life cycle of the organization's systems including:

SMS processes will be

- Documented
- Monitored
- Measured
- Analyzed.

SMS outputs will be

- Recorded
- Monitored
- Measured
- Analyzed.

It is expected that

The organization will promote the growth of a positive safety culture.

If the organization has a quality policy, top management will ensure that the quality policy is consistent with the EHSMS

The EHSMS will include a means to comply with policy, legal, regulatory and statutory requirements applicable to the EHSMS

The organization will establish and maintain a procedure to identify current policy, legal, regulatory and statutory requirements applicable to the EHSMS

The organization will establish and maintain procedures with measurable criteria to accomplish the objectives of the safety policy

The organization will establish and maintain supervisory and operational controls to ensure procedures are followed for safety related operations and activities

The organization will establish and maintain a safety management plan to describe how it will achieve its safety objectives.

3.2 SAFETY EDUCATION AND TRAINING

Training to the workers is the key element of an environmental health and safety management system. Employers must communicate with workers so that they understand that health and safety is considered to be an important part of the work process, and they are aware of how to do their jobs safely. Well trained and competent workers not only perform their job safely, but also, more productive. Training will pay-off immediately. Employers should also be aware that some training is required by law. That if the work being carried out is considered hazardous, the employer must ensure the workers is competent or is under the direct supervision of a competent worker.

Every factory shall establish training programs which may include, but not limited to the following,

- Refresher training of experienced workers to highlight the specific changes and issues.

- Training of safety committee members to familiarize them with the basic understanding and knowledge of the roles and functions of safety committee.

Training on basic first aid.

Training for fire watchmen or Attendant.

Training for safety inspector, in particular, fees hot work certification.

Training for safety officers.

Instruction for requirements and the effective use of personal protective equipment.

Just as safety engineering is the most effective way of preventing accidents involving unsafe mechanical and physical conditions, safety education is the most effective tool in preventing accidents by human causes. Through adequate instruction, personnel gain useful knowledge and development of safe attitudes. Training is particularly important in accident prevention control; it gives each employee a personal safety tool by developing habits of safe practice and operation.

3.3 MAJOR ELEMENTS OF ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT SYSTEM (EHSMS)

The major elements are as follows

Occupational Health & Safety Policy

Safety Education and Training

Motivational and Promotional Measures for OS & H

Safety Manual and Rules

Compliances with Statutory Requirements

New Equipment Review / Inspection

Accident Reporting Analysis Investigation and Implementation of Recommendations

Risk Assessment including Hazard Identification

Safety Inspections

Health and Safety Improvement Plan / Targets

First aid Facilities – Occupational Health Centre

Personal Protective Equipment (PPE)

Good Housekeeping

Machine and General Area Guarding

Material Handling Equipment

Electrical and Personal Safeguarding

Ventilation, Illumination and Noise

Work Environment Monitoring System

Prevention of Occupational Diseases Including Periodic

Medical Examination

3.4 FIRST AID & OCCUPATIONAL HEALTH CENTERS (OHC)

The industry must have adequate first aid boxes. There must be a qualified or trained person should always be available in each shift. Providing safety and health center in the organization itself or should sign MOU with the nearest hospital for emergency purpose. Pre-medical examination should be carried out when the employee joined the industry.

3.5 PERSONAL PROTECTIVE EQUIPMENT (PPE)

Workers needing to wear personal protective equipment (PPE) and persons working in high risk situations will need special training. Supervisor and workers alike must teach the proper selection, use and maintenance of PPE. Since PPE sometimes can be cumbersome, employees may need to be motivated to wear it in every situation where protection is necessary. Therefore, training will begin with the clear explanation of why the personal protective equipment is necessary, how it is used will benefit the wearer and what its limitations are.

Reminder should be made to employees to protect them and of their efforts, not only to eliminate and reduce the hazards, but also, to provide suitable PPE when being asked to wear it. Individual employee will become familiar with the PPE is being asked to wear. This is done by handling it and putting it on. Training will consist of showing employees how to put the equipment on, how to wear it properly, and how to test for proper fit and how to maintain it. Proper fit is essential if the equipment is to provide the intended protection. Safety department will conduct periodic exercises in finding, donning and properly using emergency personnel protective equipment and devices.

3.6 ENVIRONMENTAL HEALTH, HAZARD IDENTIFICATION AND CONTROL

3.6.1 ENVIRONMENTAL IMPACT ASSESSMENT (EIA)

The Environmental inventory is a complete description of the environment as it exists in an area where a particular proposed action, like setting up a chemical factory, is being considered, the environmental impact assessment is an attempt to evaluate the consequences of a proposed action on each of the descriptions in the environmental inventory.

The essential steps in an environmental impact assessment are:

- Prediction of the anticipated change in an environmental descriptor.
- Determination of the magnitude or scale of the particular change.
- Application of an importance or significance factor to the change.

3.6.2 PURPOSE OF HAZARD IDENTIFICATION AND CONTROL

A hazard identification and risk assessment processes used to identify and evaluate both existing, potential hazards on a worksite and the methods used to control or eliminate the hazards identified. The assessment process must be completed prior to the start of all jobs to identify existing or potential hazards to workers and eliminate or control these hazards through the use of engineering or administrative controls, proper training or the use of personal protective equipment. All company staff and contractors are required to take a proactive approach to managing and reporting hazards. When they observe a hazard, they are required to take steps to manage that hazard directly (provided they are adequately knowledgeable / trained to safely do so) – eliminate the hazard or get assistance from appropriate persons to do so whenever reasonably possible. Where hazards cannot be eliminated immediately, take necessary steps to warn others of the hazard. Report hazardous or potentially hazardous conditions and acts to a supervisor or your site contact if a contractor.

STEP 1: IDENTIFY THE HAZARDS

The first main important work of a supervisor is to start the hazard identification process before the job begins by identifying hazards that are known to exist on site and documenting them. By identifying hazards early, the supervisor may be able to implement controls before any workers arrive on site.

To ensure the process is thorough the supervisor should:

Look at all aspects of the work; include non-routine activities such as maintenance, repair, or cleaning, look at accident / incident / near miss records, include people who work "off site" either at home, on other job sites, drivers, tele-workers, with clients, etc., look at the way the work is organized or "done" (include experience and age of people doing the work, systems being used, etc.), look at foreseeable unusual conditions (for example: possible impact on hazard control procedures that may be unavailable in an emergency situation, power outage, etc.),

Examine risks to visitors or the public, Include an assessment of groups that may have a different level of risk such as young or inexperienced workers, persons with disabilities, or new or expectant mothers.

STEP 2: ASSESS THE RISK

Ranking or prioritizing hazards is one way to help determine which hazard is the most serious and thus which hazard to control first. Priority is usually established by taking into an account of the employee exposure and the potential for accident, injury or illness.

By assigning a priority to the hazards, the following factors play an important role:

Percentage of workforce exposed,

Frequency of exposure,

Degree of harm likely to result from the exposure, probability of occurrence.

STEP 3: DEVELOP SAFE PRACTICES

Once the risk has been assessed, the appropriate controls need to be put into place.

The main ways to control a hazard include:

Elimination (including substitution): Remove the hazard from the workplace.

Engineering Controls: includes designs or modifications to plants, equipment, ventilation systems, and processes that reduce the source of exposure.

Administrative Controls: Controls that alter the way the work is done, including timing of work, policies and other rules, and work practices such as standards and operating procedures (including training, housekeeping, and equipment maintenance, and personal hygiene practices).

Personal Protective Equipment: Equipment worn by individuals to reduce exposure such as contact with chemicals or exposure to noise.

STEP 4: COMMUNICATE THE CONTROLS AND TRAIN THE WORKERS

Once the control has been put into place, the workers need to be trained in how to use it. This applies whether it is an engineering control such as a guard or interlock or an administrative control such as a safe work procedure for cold weather or particular PPE when handling a chemical. Training records and/or

Documented sign-offs are required to show that the workers have been made aware of the hazards and the controls.

STEP 5: SAFETY REVIEW PERIODICITY

Repeat the hazard assessment process every 2 years or when site conditions change, when new tasks are added or when new workers join the crew, in order to prevent the development of unsafe working condition.

New equipment review: The system is would be affected for any change in existing plants, equipment or processes. It should be approved by the appropriate competent authority of Safety Communication.

Safety Communication is often the single most important area to be improved in a company. One conclusion from most organizational assessments is that, there is not enough and relevant information available, and that the two-way information flow is inadequately arranged. The messages that top management wishes to communicate are not always the ones employees receive or see as relevant. On the other hand, it is common that employees feel that their own ideas and needs are not sufficiently heard of the higher levels.

3.7 ELEMENTS OF SAFETY MANAGEMENT SYSTEM

Safety Management System: Safety Management System is an Organized and structured means of achieving and maintaining high standards of safety performance.

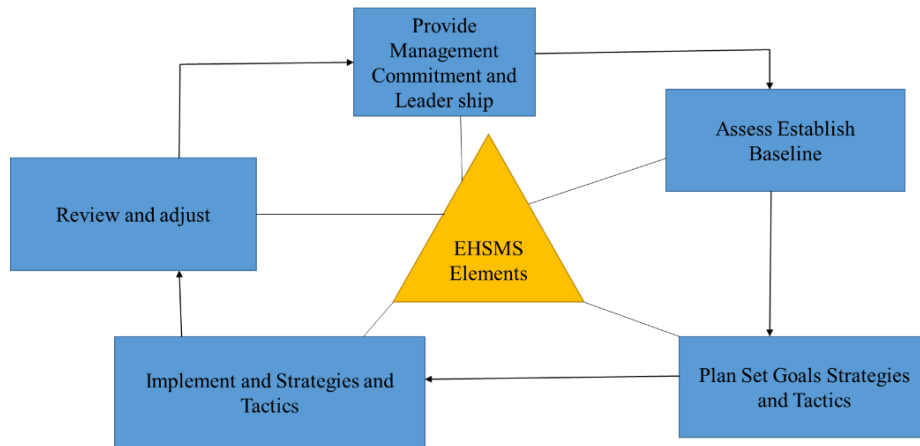


Figure 1 Organizational Structures of EHSMS Elements

4. ELEMENTS OF SAFETY MANAGEMENT ADMINISTRATIVE AND MANAGEMENT ELEMENT

Management Leadership and Commitment

Organizational Communications and System Documentation

Assessments, Audits and Evaluations

Operational and Technical Elements

Hazard Recognition, Evaluation and Control

Workplace Design and Engineering

Operational Safety and Health Programs

Cultural and Behavioral Elements

Employee involvement

Motivation, Behavior and Attitudes

Training and orientation

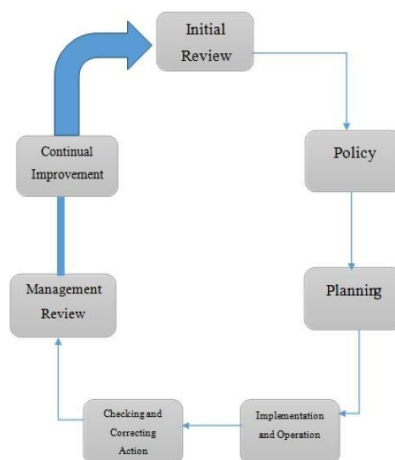


FIGURE 2 ENVIRONMENTAL HEALTH AND SAFETY MANAGEMENT SYSTEM

4.1 PROVISIONS RELATING TO SAFETY PRECAUTIONS REGARDING THE USE OF PORTABLE ELECTRIC LIGHT

Portable electric appliances operating at voltages more than 24 volts are not permitted for use inside confined spaces until adequate safety measures are taken.

In Case, inflammable gas, fume etc. are likely to be present in this section requires the use of electrical appliances of flame proof construction **Precautions in case of fire:** Precautions are to be taken in every factory to prevent out-break of fire and its spread.

This section also lays down certain requirements regarding safe method of escape and facilities for extinguishing of fire. It also empowers the chief inspector of factories to order addition measures to be taken in a particular factory to prevent outbreak of fire and also the protection of workers against such fires.

Power to Require Specification of Defective Parts or Test of Stability: if any plant or machinery in a factory is in a condition dangerous to human life or safety, the Inspector is empowered under this section to call for drawing and specification to determine the safety of such plant or machinery. He is also empowered to ask the management to carry out such tests which he may specify and to inform him of the results.

Safety of Buildings and Machinery: If any building, machinery or plant in a factory is proving dangerous to human life, the inspector, under this section can ask management to take remedial measures within a specified date. If any imminent danger is involved, he may even prohibit the use of such machinery, plant or building until they have been properly repaired.

Maintenance of Buildings: Under this section, an inspector is empowered to ask the occupier of a factory or the manager to carry out, within a specified date, urgent repairs to any building or part of building in the interest of the safety and health of the workers.

Safety Officers: Every factory employing 1000 workers or more or carrying out process involving risk of bodily injury shall appoint safety officer under this section, if required by the state government through a notification.

This section also lays down, power of the state government to prescribe duties and qualifications for safety officers.

4.2 PLAN SAFETY INSPECTION

Plant safety inspection is carried out by the safety officers to identify unsafe acts and conditions and to suggest corrective actions.

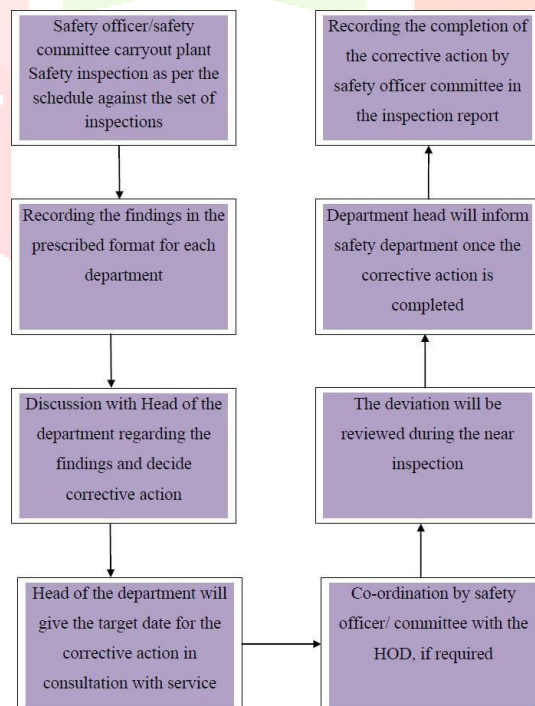


FIGURE 3 PROCESS FLOW FOR PLANT SAFETY INSPECTION

4.3 RISK ASSESSMENT INCLUDING HAZARD IDENTIFICATION

To establish a system to apply and maintain recognized methods to identify, evaluate, control and mitigate hazards and potential hazards.

These methods shall include elimination or reduction of the risk and consequence of the hazards to as low as is reasonably practicable.

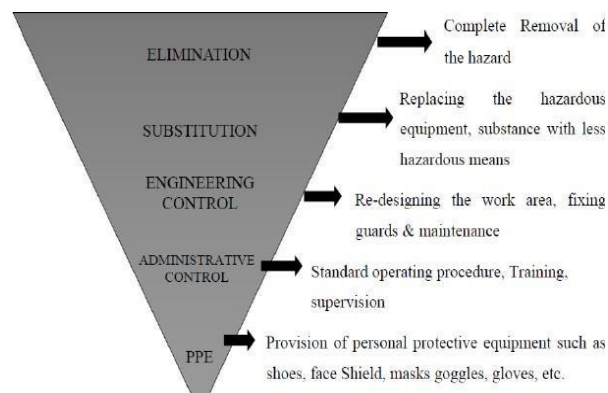


FIGURE 4 HIERARCHY HAZARD CONTROLS IN MSMES

A hazard analysis shall be applied to the following

- Factory and Process design
- Operations
- Equipment employed
- Materials and chemical used

The factory shall establish and maintain a program for the identification and assessment of the hazards. The program shall aim at:

- Identification and recording of known hazards,
- Identification and recording of new and potential hazards,
- Assessment of the hazards using qualitative or quantitative appropriate techniques,
- Analysis of the effects or potential effects

Development and implementation of the means to eliminate or to control and manage the hazard in a manner that is as low as reasonably practicable.

Development and implementation of emergency or contingency plan.

The factory shall ensure that persons responsible for the hazard analysis and for determining the means of eliminating, reducing and controlling the risks are;

Technically competent

Given the management supports to effectively perform their duties

Given the authority to implement the approved procedures

5. CONCLUSION

The food and drink industries are not commonly perceived as constituting a serious safety and health problem in the same way as, for example, the mining or construction industries. And yet, statistics from various countries, which are reproduced in this report, go some way to validating the claim made by some of the participants at the recent Second Session of the ILO Food and Drink Industries Committee that the sector has one of the worst records in the manufacturing sector in the field of safety and health. The evidence gathered in this report shows that the food and drink industries do indeed occupy an unenviably high position in league tables of the incidence of occupational accidents and diseases, although the number of working days lost would tend to suggest that the injuries and illnesses suffered in the sector may not be as serious as in some other manufacturing industries. There are also grounds for believing that some aspects of safety and

health in the sector are getting worse.

Moreover, mechanization has often had the effect of increasing the tempo of work and the resulting stress levels of the workers, as well as increasing the number of monotonous and repetitive tasks, with a consequent rise in the incidence of musculoskeletal disorders. Increased mechanization has also been accompanied by higher noise levels, which has led to more workers suffering from hearing impediments. Other common safety and health problems in the sector arise out of the use of sharp cutting tools, the prevalence of dust in the air.

Despite the generalized food and drinks industry required to implement safety structure and strong biller of safety standard operation polices (SOP), In the economic recession in recent years, the food and drink industries have continued to expand in response to the growing worldwide demand for processed food and drinks. In this context of expansion and intensified competition, as a result, although output and the overall worldwide employment level in the sector have continued to expand, employment in individual enterprises, particularly in the highly capital-intensive drinks industry, has suffered.

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