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Assessing the Workplace Risk in Food Industry

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Abstract - *Occupational safety and health(OSH) problems of the food industry have not been generally perceived as a serious issue in the same way as other industries such as manufacturing, transportation, mining, and construction sectors. Statistics from various countries show that OSH issues from the food sector have gained least interest than the other manufacturing. The assessment of the hazards in the workplace is an important task to evaluate the causes of the accidents. This will find the solution for the hazards and to create a safe working place for the employees. The workplace has experienced rationalization, restructuring, and a high level of mechanization, in both the industrialized and developing countries. This present work overviews the hazards in the work place, their assessment and recommend to reduce the hazards in the workplace.*

Key Words**: **HIRA, Hazards, Food industry, Risk Assessment, Risk Identification.

1. INTRODUCTION

Food industry is a vast industry that covers a wide scope. Owing to the very fact that food industry is one of the largest in a country, it is logical to assume that the potential of OHS incidents is also quite high. [1-5]

The food industry covers a highly diversified range of activities. Although some concerns and risks are common to the whole sector, others are more specific to certain branches of the industry. One of the general factors shared by all branches of the food industry is that they are required to follow strict health and hygiene standards, since their products can affect the health of consumers. [6-12]

OSH is a precondition to protect health of the worker and help them to work in decent, safe and healthy way that the proprietors of corporations fulfill the main objectives of social responsibility. [13-18]

As the human factor has very imperative role in workplace accidents, it should be given due significance in accident prevention strategies. Occupational Health and Safety needs to be built-in in all the organizations decisions and actions to achieve the goal of safe and conducive workplace. [19-23]. The current study focus on the risk is to be identified and it has been assessed for the reduction of the available risk in the work place.

2. Methodology

Hazard Identification and Risk Assessment (HIRA) is a process that consists of a number of sequential steps such as hazard identification, consequence & frequency assessment, risk estimation based on the existing controls and recommendations to reduce those risks which are not under acceptable limits to be effective, the organization procedures for HIRA should take account of the hazard, risk, controls and documentation.

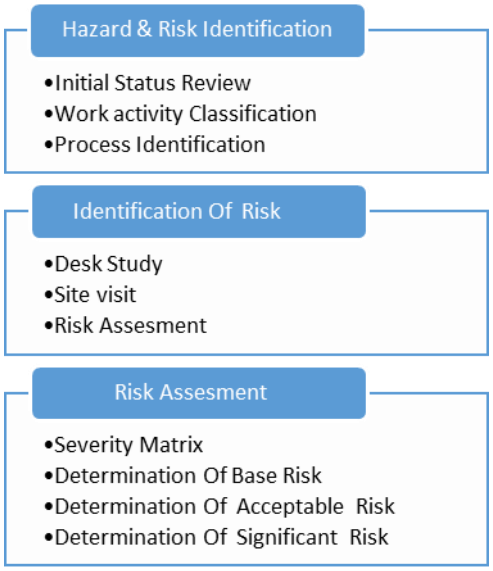

Fig 2.1: Hazard Identification and Risk Assessment Process

2.1 General Procedure

The team is headed by EHS and comprises representatives from production, maintenance, quality and Security. The Risk Register is compiled based on the results of the Initial Status Review conducted. Observation has been

made to list the work activities in every process. It shall take into account all routine and non-routine activities and activities of all personnel having access to workplace. Using a 4-by-4 severity of harm and likelihood of harm criteria risk assessment methodology to evaluate the level of acceptable risk involved in the work activities. The results from the risk assessment form the basis of the Safety and Health Management significant risks are founded.

3. HAZARD AND RISK IDENTIFICATION

3.1 Initial Status Review

The methodology for evaluating the baseline from which EHS performance can be improved and comprises three stages: desk study, site visit and risk assessment. The desk study involves the review of a health and safety prompt list that helps to identify the main hazards of the current operations prior to the site visit. Other relevant data including permits and licenses, material safety data sheet, monitoring results and other EHS records were reviewed. The site visit consists of a comprehensive risk identification exercise which considers the full range of hazards of the services and activities conducted on site.

3.2 Work Activities Classification

Geographical areas within and outside the premises, Stages in the production process, or in the provision of a service, planned and reactive work, defined task, and a combination of the above. A list of work activities including Information such as duration and frequency of task, location of task, personnel training and current risk controls is prepared.

3.3 Process of Hazard and Risk Identification

In risk identification, three questions were asked:

1. Is there a source of harm?
2. Who (what) could be harmed? and
3. How could harm occur?

The risks are identified for routine / non-routine activities, and for activities involving all personnel including contractors and visitors having access to work place due to Infrastructure, equipment and materials at the workplace, whether provided by the organization or others. Even Risks originating outside the workplace capable of adversely affecting the health and safety of persons under the control of the organization within the workplace is identified. Due consideration is given to identification of risks occurring due to human behavior, capabilities and other human factors.

4. IDENTIFICATION OF RISK

4.1 Desk study

The desk study involves the review of health and safety prompt list that helps to identify the main hazards of the current operations prior to the site visit. Other relevant data including permits and licenses, monitoring results and other EHS records were reviewed.

4.2 Site Visit

Site Visit which includes the following activities: Details of location where work is carried out, the activities carried by workers in workplace, the activities which are at risk, Work activities with written instructions, system of work and/or permit to work procedures, prepared for hazardous tasks, The activities which use of control measures, environmental conditions affecting the workplace, details of access to and adequacy of emergency procedures, emergency escape plans, and emergency equipment, emergency escape routes, emergency communication facilities.

5. RISK ASSESSMENT

The identified risks are assessed for their levels of significance through risk assessment based on the severity and probability of occurrence of the risks for base risks and residual risk levels are calculated based on the reduction of rating in probability of occurrence due to the presence of existing controls. The existing controls are identified from 0 to 10 in the guideline.

5.1 Parameters of Risk Assessment

The Risk Assessment is based on the tolerability of risk. The level of risk is evaluated by estimating the potential severity of harm and the likelihood of harm. When rating hazards and risks, the adequacy of the risk control measures already implemented needs to be considered. When considering the severity of harm, factors such as part(s) of body affected and number of personnel at risk shall be taken into account.

Table 5.1.2 Probability Matrix

Probability of occurrence	Frequency
Highly unlikely (1)	More than once a year and above
Unlikely (2)	Once a month to Year
Likely (3)	Once a week to month
Very Likely (4)	Multiple times a day to week

5.1.1 Severity Matrix

When considering the likelihood of harm, factors such as the number of exposed personnel, the frequency and duration of exposure, potential failure of services, machinery and safety devices, exposure to elements, use of personnel protective equipment and unsafe acts shall be taken into account.

5.2 Identification of Base risk, Acceptable Risk and Significant Risk

The risk level is determined by the multiplication of severity and Probability of occurrence. (Score = Severity x Probability of occurrence).

The Base risk is calculated based on the rating of severity and likelihood before considering the existing controls. The acceptable risk is calculated after considering the existing controls. The significant risks are determined by the score of acceptable risk after applying the control measures.

6. RESULTS AND DISCUSSION

6.1 Acceptable Risk

Most of the risks are controlled by the successful implementation of existing control measures. So, the risks become low risk and are acceptable as per norms. Those low risk risks are acceptable by the company norms.

6.2 Significant Risks

Some high risks definitely need to be controlled and control measures for these risks to be implemented in order to avoid accident and incident in future.

S.No									
Dept									
Sub Dept									
Activity									
Description of the Activity									
Type of Activity									
Hazard Management	Type of Hazard								
	Hazard Scenario								
	Consequence								
Condition (N/A/E)									
Legal /Other req (A/NA)									
Base Risk	Severity								
	Probability								
	Score								
	Category								
Existing Control									
Acceptable Risk	Severity								
	Probability								
	Score								
	Category								
Significant									
Additional controls Suggested									

Fig 4.5.1 HIRA Sheet template

6.2.1. Fall from Height

For the access of the two-preparation tank there is only provided with the temporary access platform is provided one single platform is used for the two-preparation tank so workers instead of moving the they try to reach the other tank by stretching there is a chance of fall for height.

6.2.2. Entrapment of Fingers

Clean the gauge roller in the 50-50 and Marie gold Forming section involves the risk of entrapment of fingers into the gauge roller which has the higher probability of injury.

6.2.3. Injury

Clearing the diverter box form the biscuit choke when the machine is online the divertor box which has the higher probability of the finger entrapment the divertor box which has the very less clearance for the finger which will cause the injury.

6.2.4. Finger Entrapment

Finger entrapment in the ladder propeller roller while checking the wrapper matching the packing machine which has the risk of the finger entrapment in the propeller roller or the ladder chain.

6.2.5. Hit by the Moving Object

Moving parts of the CBB taping machine which has the exposure automated moving parts which has the higher chance of the hit by the object which will cause the injuries to the worker.

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6.5 Control Methodology

The significance of the hazards and risks are classified and evaluated for establishment of appropriate control methods in hierarchy of considerations given in the following order elimination, substitution, engineering controls, signage's / warnings / administrative controls and PPE's. The methodology is consistent with operating experience and capabilities of risk control measures employed. It provides for input into determination of facility requirements which may be achieved through management programs, identification of Monitoring parameters and training needs and development of operational controls.

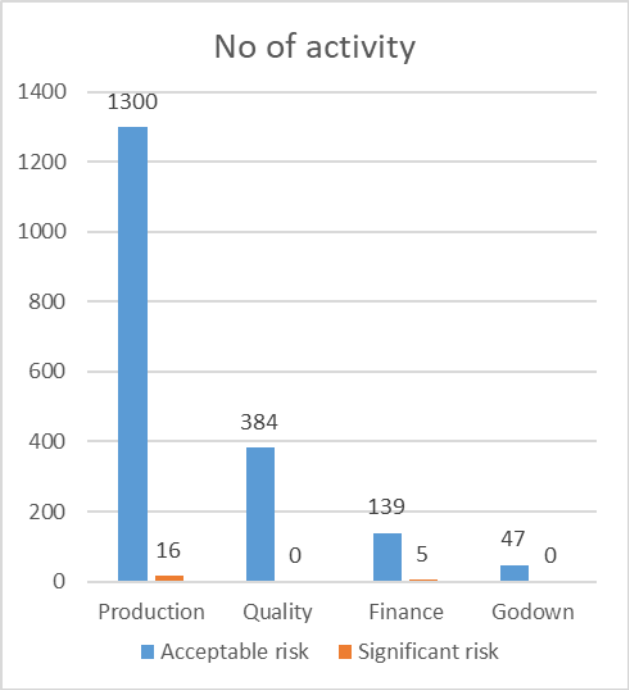

Chart -1: Acceptable and Significant Risk

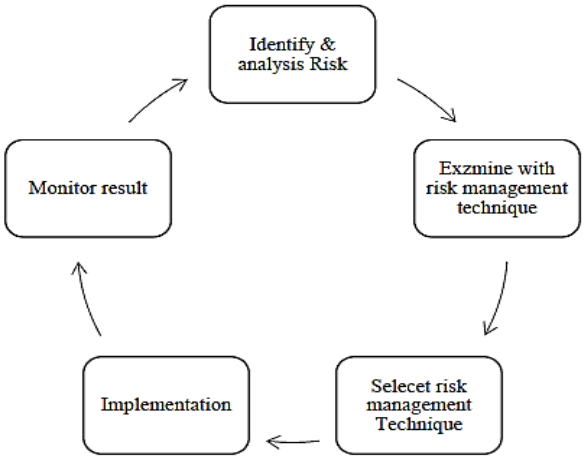

Fig. 6.5.1 Control Methodology

6.6 Prioritizing Action Plan

Action Plans is prioritized in accordance with the level of significance of the risk evaluated and is planned in the order of relevance are Elimination, Substitution, Engineering Control and Signage's / warnings / administrative controls.

7. CONCLUSIONS

Food industries are one of the processing industries with highest accident occurrences, in order to minimize the risks of accidents safety risk assessment was conducted using HIRA method. HIRA was used to identify the hazards that have highest risk level.

There are only few hazards that have very high level of risk in the outer area itself i.e. fall from height, Slip/Trip/Fall, Unintentional movement of vehicles, hit by Hydraulic pallet trucks, fire and explosion and fall into open tanks. It is inferred that the risk levels involved in other activities are moderate owing to the stringent existing control measures.

The food processing industry was found to be practicing a sound safety management system concentrating on the 5S principles, KAIZEN, Evaluation/Inspection at every month, Education/Training as per training calendar, Encouragement/Motivation and Enforcement through continuous and structured awareness creation and training program. The above effort was also supported by the establishment and the implementation of OHSAS 18001.

Even the minor injuries of first aid and near misses are also observed using walkthrough survey and employee feedback. The notified observations are also investigated and appropriate corrective and preventive actions are initiated and the effectiveness of implementation is monitored.

Through the above conclusion which shows that the risk and hazards of the industry will be reduced through the continuous assessment of the activities and implementation of the findings through the assessment.

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BIOGRAPHIES

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