

Job Safety Analysis In Fire Crackers Industry

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Abstract- The main objective of this paper is to identifying the hazard and risk associated in various job in different sections which are being carried out in the Fire Cracker Factory and to minimize the hazards in order to make the working environment safe for the workers, so for this purpose we have used Risk assessment methodologies such as Job Safety Analysis for identifying hazards and its consequences by analysing all the processes in the workshop.

Keywords- Job Safety Analysis, Risk Rating, Fire Cracker Factory, Risk assessment

I. INTRODUCTION

Fire Cracker Industries is a place where manufacturing and packaging of cracker is carried out .During the Manufacturing and Packaging of cracker there is high probability of accidents on every working day. Various hazards are faced during Manufacturing, Fuse cutting, Waste burning , Packing ,Weighting of chemical, Carrying Chemicals, Mixing, Fuse Fixing, Fancy, Lighting, Testing of samples, and the working machine and equipment used during the manufacturing work which result in minor or major or fatality, due to this there is loss of man-hours and to aimed man-power. This may directly affect the manufacturing schedule. So a great concern is needed to minimize the occurrence of these hazards and for this purpose it is very necessary to analyze the Risk Assessment in order to make the work place safe, As worker and other have a right to be protected from harm caused by any kind of failure and also to take reasonable control measure which ever are necessary. For the purpose we will be using various risk assessment hazards and its consequences by analysing all the processing which are being carried out in the workshop .Safety recommendation will be given on basis of above analysing to reduce the hazard during the manufacturing work.

II. MATHODOLOGY

Risk assessment is a careful explanation of what can cause harm to people in their work place so that one can check whether enough precaution are taken or should do more to prevent harm. And the first step to this is the hazard

identification so that one could know whether one level of risk actually exists.

Job Safety Analysis: - Job Safety Analysis is an accident prevention technique that is use to identification the potential hazard associated to the job and give the control measure to minimized the hazards.

An analysis including five steps:-

1. Select a Job.
2. Break the Job down into steps.
3. Identify the potential hazards.
4. Apply the control to the hazard.
5. Evaluate the controls.

Both approaches to risk assessment are the most commonly applied. Risk assessment method are quickly and relatively easy to use as board consequences and likelihoods can be identified and they can provide a general understanding of comparative risk between risk event, and the risk matrix can be used to separate risk events into risk classes (rating). A logical systematic process is usually followed during a risk assessment to identify the key risk events and to assess the consequences of events occurring and the likelihood of their occurrence.

JOB SAFETY ANALYSIS WORKSHEET

FILLING 4.1

COMPANY NAME: -.....

DATE:-.....

SITE NAME:-.....

PERMIT TO WORK:-.....

UNIT INCHARGE:-.....

APPROVED BY:-.....

	WORK	HAZARDS	CONTROLS
1.	Taking the chemical from ware house.	Falling ,slipping	Wear anti slipping Gauntlet gloves, apron, shoes during working.
2.	Handling of chemicals for mixture.	Eye, Skin, Nose irritation, Headaches, Kidney problem, Prolong exposure affect kidney, White blood cell, Thyroid.	Nose Mask, Safety gloves, Closed eye spectacles.
3.	Weighting for proper mixture of chemical.	Falling ,slipping	Wear anti slipping gloves, shoes during working.
4.	Filling into the roll cap.	Nose irritation, Chest tightness, Shortness of breathing, Irregular Heart beat.	Air purifying devices, Nose Mask.
5.	Transferring to Fuse inserting.	Eye, Skin, Nose irritation, Headaches, Kidney problem, Diarrhea, Muscle weakness.	Use wrist gloves and closed eye goggles, apron (Positive pressure ventilated plastic suits).

**JOB SAFETY ANALYSIS WORKSHEET
MIXING PROCESS**

COMPANY NAME:
 DATE:-.....
 SITE NAME:-.....
 PERMIT TO WORK:-.....
 UNIT INCHARGE:-.....
 APPROVED BY:-.....

S.NO.	WORK	HAZARDS	CONTROLS
1.	Collecting all type of chemical Like Oxidisers, Igniters sand and Special effect chemical.	Slipping of bag or Chemical may fall.	Wear anti slipping Gauntlet gloves, apron, shoes during working.
2.	Mixing operation done manually.	Eye, Skin, Nose irritation, Headaches problem.	Use wrist gloves and closed eye goggles, apron (Positive pressure ventilated plastic suits).
3.	Mixing in trays.	Friction causes fire.	Use wooden tray.
4.	Mixed chemical placed to tube filling.	Static electricity charges cause fire	Use metal plate in outside of room wall.
5.	Charcoal chemical mixing for cotton wicks.	Shortness of breathing, Irregular, Heart beat Eye, Skin, Nose irritation, Headaches problem	Nose Mask, Safety gloves, Closed eye spectacles.

Probability	Severity			
	Extremely Hamful 4	Harmful 3	Slightly 2	Insignificant 1
Very Unlikely 1	16	12	8	4
Unlikely 2	12	9	6	3
Likely 3	8	6	4	2
Very Likely 4	1	3	2	1

Matrix method in Risk Assessment is a semi-quantified way of determination Risk value is determined by estimating of the potential severity of hazardous event and the likelihood that it will occur. Risk value is formulated as:-

$R = P \times S$
 Where,
 P= Likelihood of occurrence.
 S= Potential Severity of Harm.

Now,
 For filling the mixture of chemical into the Roll cap.
 Work: - Handling of chemical for mixing

$$R = P \times S$$

$$= 4 \times 3 = 12$$

Risk that should be reduces so that they are tolerable or acceptable.

Work: - Taking the chemical from Wear house.

$$R = P \times S$$

$$= 4 \times 3 = 12$$

Risk that should be reduces so that they are tolerable or acceptable.

Similarly for,
 Mixing

Work: - Collecting all type of chemical Like Oxidisers, Igniters sand and Special effect chemical.

$$R = P \times S$$

$$= 3 \times 4 = 12$$

Risk that should be reduces so that they are tolerable or acceptable.

Work:- Mixing operation done manually.

$$R = P \times S$$

$$= 4 \times 3 = 12$$

Risk that should be reduces so that they are tolerable or acceptable.

Risk Rating Criteria: -

Category of Risk	Evaluation of tolerability
Very low (Level 1,2,3,4)	Acceptable or (Negligible)
Low (Level 5,6)	Risks that should be reduced so that they are tolerable or acceptable (unwanted)
Medium (Level 10,11)	Risks that should be reduced so that they are tolerable or acceptable (unwanted)
Very high (Level 15,16)	Unacceptable

III. CONCLUSION

The use of Risk Assessment methodologies contributes to the prevention of accidents and helps to make the system a safe place to work. Thus in this analysis Job Safety Analysis has been performed in every section of the industries Potential hazards associated to manufacturing work under different section have been identified and proper control measure have been recommended by preparing Job Safety Analysis Worksheet.

Risk Rating is also calculated of each work as per hazards identified and listed in JSA worksheet which are

performed during manufacturing. This may help to know the level of risk faced while performing work.

Safety regulations must be established in all the fire factories. This rule must include the maximum amount of chemical that can be handled at one time and an absolute prohibition on smoking while making firework. The factories workers should focus exclusively on making firework in order to avoid carelessness resulting in rough handling. The fire work should not be exposed to direct sunlight while drying outdoors, especially in summer.

Firework making should be suspended in lightning storms that can result in short-circuit.

The analysis clearly shows that the accidents are held mostly due to human error, An effective safety management with the proper training and education for the workers may prevent the accidents considerably.

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