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A STUDY ON SAFETY MANAGEMENT IN FIREWORKS INDUSTRY SIVAKASI, VIRUDHUNAGAR DISTRICT

Article Particulars
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Abstract

Fireworks industry is mostly prone to fire and explosion. The hazardous nature of chemical is used to produce the scintillating lighting of the fireworks crackers. The aims of this study are to analyse safety management and evaluate the causes for fire and explosions in fireworks factories. Data on age, sex and various safety facilities available in the factories, causes of explosions and preventing measures were recorded. The result of the analysis reveals that most accidents were caused by lack of awareness about chemical reaction and carelessness while making fireworks.

Introduction

Everyone in the industrial establishment from the top executive to a worker plays a part to create safe working conditions and adopt safe working practices. Statutorily, the employers are also now required to take effective measures to protect the environment around their industrial establishments from pollution and accident that may be arising from their establishments

Workplace accident can damage company morale, causing apprehension and sadness. Most employees have the expectation that their workplace will offer a safe environment in which to do work. Some workplaces are safer than others just as some occupations offer more safety than others. While some industries and jobs have greater risks associated with them than others, accidents can happen almost anywhere. Using common sense and safety training can reduce the likelihood of an employee getting hurt. This not only avoids employee injury, but also loss in morale from unfortunate occurrences. Even though there is great part by the government and the organization, the safety lies in the hands of the employees. They have to follow the safety norms scrupulously without violation of the norms. There is scope for educating the employees and a study, is needed to know the safety awareness of the employees of risk prone fireworks industry in Sivakasi.

Review of Literature

Kwok wing keung (1997), in his study "Safety management training in construction industry in Hong Kong" describes the current trend of safety management training in Hong Kong. It is the great determination of the Hong Kong Government to improve health &safety of workers in the industrial under takings, in particular the construction industry. Future trends of safety management training and its implication are discussed.

Cheyne, Oliver, Tomas and Cox (2002) conducted a study on employee attitudes towards safety in the manufacturing sector in UK. The study identified safety standards and goals, and safety management, which include personal involvement, communication, workplace hazards and physical work environment as factors that enhance safety activities in organization. The study found that a good physical working environment and employee involvement were key factors that contributed to safety activities in organizations. Safety training and safety policy are also essential determinants to enhance safety performance. Safety training is defined as knowledge of safety given to employees in order to work safely and with no danger to their well being (Law, Chan & Pun, 2006).

Objectives of the Study

The following are the main objectives of the study:

- To understand the safety environment prevailing in the fireworks industry in Sivakasi.
- To provide suggestions in the light of findings of the study.

Methodology

The study has been descriptive and analytical. The research problem, objective and interview schedule have been formulated accordingly. The suggestions of the study emerge from the inference drawn from the survey of workers of the fireworks industry in Sivakasi.

(A)Primary Data

The present study is an empirical one based on the survey method. First hand data was collected from the field through interview schedule. Data relating to the workers of the fireworks industry in Sivakasi was gathered through interview schedule. The schedule, structured was extensively pretested. Sample workers were selected by the application of simple random sampling.

(B)Secondary Data

The secondary data was collected from the standard text books, journals and published documents and websites.

Sampling Design

Simple random sample was used to select the workers of the fireworks industry in Sivakasi. A sample survey of workers in fireworks industry in Sivakasi was conducted. Thus a sample of 250 respondents were contacted. The survey was conducted during

January to February, 2018. The completed questionnaires were checked immediately on the spot in order to avoid revisits.

Result and Discussion

Factor Analysis

There are many factors which lead to accident in fireworks industry. Factor analysis was performed with the objective of understanding the perception of the workers of the fireworks in Sivakasi about safety environment prevailing in their fireworks. Factor analysis is typically applied to intervally-scaled responses to questions about a particular product or service to indentify the major characteristics or factor considered to be important. In short, factor analysis assists to identify one or more sets of statements which result in highly correlated responses. The idea is, if the respondents to a set of three or more statements are highly correlated, then it is believed that the statements measure some factor, which is common to all of them.

H_0: Factor analysis is not valid

H_1: Factor analysis is valid

KMO and Bartlett's Test

Table 1

Kaiser-Meyer-Olkin		.573
Bartlett's Test Of Sphericity	Approx. Chi Square	414.607
	DF	.190
	Sig	.000

The value of Kaiser-Meyer-Olkin Measure of sampling adequacy of .573 is just adequate. The p-value (0.000) is less then the assumed value (0.05), and so null hypothesis is rejected, and concluded factor analysis is valid. Factor, KMO co-efficient .573 is found to be more than 0.5, this indicates that there is adequacy of sample and factor analysis is valid.

Communalities

Table 2

Variables	Initial	Extraction
Safety environment relating to building layout	1.000	.592
Safe access in working place	1.000	.644
Safe Condition of floors, stairs, and passage	1.000	.543
Proper Arrangement for storage of tools and scraps	1.000	.597
Isolation of processes with high fire or explosive risk	1.000	.490
Adequate means of escape in case of fire	1.000	.723
Sound Ventilation and lighting	1.000	.571
Personal protective equipments	1.000	.661
Provision of tools	1.000	.590
Safe disposal of fireworks process wastes	1.000	.620
Provision of fire fighting facilities	1.000	.606
Good housekeeping	1.000	.570

Training of new entrants	1.000	.576
Counseling	1.000	.566
Safety counselor or safety committee	1.000	.683
Accident preventive measures	1.000	.530
Good Working conditions	1.000	.718
Working hours or overtime	1.000	.445
Knowledge about chemicals	1.000	.520
Safety rules adopted by management	1.000	.638

Total Variance Explained

Table 3

Component	Initial Eigen values			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of variance	Cumulative	Total	% of variance	Cumulative	Total	% of variance	Cumulative
1	2.232	11.161	11.161	2.232	11.161	11.161	1.751	8.753	8.753
2	1.919	9.596	20.758	1.919	9.596	20.758	1.728	8.642	17.395
3	1.607	8.033	28.791	1.607	8.033	28.791	1.641	8.203	25.598
4	1.366	6.831	35.622	1.366	6.831	35.622	1.508	7.540	33.139
5	1.287	6.437	42.060	1.287	6.437	42.060	1.486	7.428	40.566
6	1.262	6.312	48.372	1.262	6.312	48.372	1.356	6.779	47.346
7	1.143	5.716	54.087	1.143	5.716	54.087	1.270	6.350	53.695
8	1.065	5.326	59.414	1.065	5.326	59.414	1.144	5.718	**59.414**
9	.998	4.989	64.403						
10	.894	4.471	68.874						
11	.842	4.212	73.085						
12	.768	3.842	76.928						
13	.757	3.787	80.715						
14	.670	3.348	84.063						
15	.646	3.230	87.293						
16	.598	2.990	90.283						
17	.580	2.900	93.183						
18	.505	2.523	95.706						
19	.448	2.240	97.946						
20	.411	2.054	100.000						

Extraction Method: Principal Component Analysis

Eight factors were extracted by using principal component analysis for extraction and varimax with Kaiser Normalization method of rotation. By retaining only the variables with Eigen value greater than one, one can infer that 8.753 per cent of variance is explained by factor 1, 8.642 per cent of variance is explained by factor 2, 8.203 per cent of variance is explained by factor 3, 7.540 per cent of variance is explained by factor 4, 7.428 per cent of variance is explained by factor 5, 6.779 per cent of variance is explained by factor 6, 6.350 per cent of variance is explained by factor 7, 5.718 per cent of variance is explained by factor 8. These details are presented in Table 3, and one could see that a cumulative variance explained of

59.414 per cent (about 60 per cent). A significant finding is that the present study identifies four important causes of accidents, namely, more working hours, no isolation of process with high fire, inadequate knowledge about chemicals and lack of preventive measures.

Suggestions

- The management has to fix standard working hours for the workers.
- Maintain isolation of process with a high fire explosives.
- The management may provide adequate chemical knowledge to the workers.
- There is urgent need for the provision of effective accident prevention measures.

Conclusion

In order to develop a robust health and safety programme, it is essential that there must be strong management commitment and worker counseling in the effort to create and maintain a safe and health workplace. The analysis reveals that the fire accidents mostly occur due to human error. An effective safety management with a proper training and education for the workers may prevent the accidents considerably. Devising measures like automatic chemical handling system would greatly reduce the accidents. Above all, top management commitment to prevent accidents is essential.

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