

A STUDY ON INDUSTRIAL SAFETY MEASURES IN FLUORO CARBON SEALS

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ABSTRACT

This study examines the industrial safety measures followed at FCS Fluoro Carbon Seals Pvt. Ltd., Thuraiyakkam. The research focuses on evaluating safety practices such as personal protective equipment (PPE) usage, safety training, emergency preparedness, and compliance with safety policies. Primary data was collected from 100 employees using a structured questionnaire. The findings indicate that basic safety measures are effectively implemented in the organization. However, certain gaps exist in areas such as periodic training, hazard communication, and safety monitoring. The study concludes that improving training programs, strengthening safety awareness, and conducting regular safety audits can enhance employee safety and organizational performance.

Keywords: Occupational Health, Manufacturing Safety, Industrial Safety, Workplace Hazards, Personal Protective Equipment, Safety Training, Risk Assessment, Occupational Hazards.

1. INTRODUCTION

1.1 Introduction

Industrial safety has become an important aspect of modern manufacturing industries where employees work with machinery, chemicals, and high-temperature processes. Ensuring workplace safety is essential for protecting employees, improving productivity, and maintaining organizational sustainability. Effective safety practices such as the use of Personal Protective Equipment (PPE), safety training, and emergency preparedness help reduce workplace accidents and occupational hazards. This study focuses on evaluating the industrial safety measures at FCS Fluoro Carbon Seals Pvt. Ltd., Thuraiyakkam. The research examines existing safety practices, employee awareness, and compliance with

safety policies. The study also identifies gaps in training, hazard communication, and safety monitoring. The findings aim to provide suggestions to strengthen safety management systems and improve overall workplace safety and efficiency.

1.2 Key Elements of Industrial Safety

Personal Protective Equipment (PPE)

Protects employees from workplace hazards such as machinery, chemicals, and high temperatures. Proper usage of PPE like helmets, gloves, safety shoes, and goggles helps reduce workplace injuries.

Emergency Preparedness

Ensures readiness for unexpected situations such as fire accidents, chemical spills, and equipment failures. Emergency exits, fire extinguishers, and safety drills improve response time and reduce risks.

Safety Training

Improves employee knowledge about workplace hazards and safety procedures. Regular training programs encourage safe work practices and build a strong safety culture.

Safety Policy Compliance

Ensures employees follow organizational safety rules and regulations. Proper compliance helps maintain discipline and reduce workplace accidents.

1.3 Importance of Industrial Safety

- Protects employees from workplace hazards and injuries.
- Improves employee safety and well-being.
- Enhances productivity and operational efficiency.
- Reduces workplace accidents and financial losses.
- Ensures compliance with safety rules and regulations.
- Promotes a safe and healthy working environment.
- Improves employee morale and job satisfaction.
- Supports sustainable organizational growth.

1.4 Statement of the Problem

Industrial safety is essential in manufacturing industries where employees are exposed to various workplace hazards. Despite implementing safety measures, gaps may exist in training, awareness, PPE usage, and hazard communication. Therefore, this study evaluates the effectiveness of industrial safety measures at FCS Fluoro Carbon Seals Pvt. Ltd. and identifies areas for improvement.

1.5 Review of Literature

Frank E. Bird Jr. (1974) introduced the accident causation model, explaining that effective safety management and employee awareness play a vital role in preventing industrial accidents, and emphasized hazard identification and proper safety control measures to minimize risks. Dan Petersen (1988) highlighted that safety management systems and employee participation are essential for improving workplace safety, stressing the importance of regular safety audits, training programs, and strong management commitment. James Reason (1997) explained that organizational factors, poor communication, and inadequate training significantly contribute to workplace accidents and highlighted the need for developing a strong safety culture. Andrew Hale (2003) identified that employee involvement and effective safety communication improve overall safety performance and recommended continuous monitoring and risk assessment practices. Furthermore, Mohammad Fam (2012) found that safety training, proper use of personal protective equipment (PPE), and emergency preparedness significantly reduce workplace hazards and enhance employee safety.

1.6 Research Methodology

The study adopts a descriptive research design. Primary data was collected through a structured questionnaire from 100 employees of FCS Fluoro Carbon Seals Pvt. Ltd. Secondary data was collected from journals, books, and websites. Simple random sampling technique was used to ensure unbiased responses. Statistical tools such as percentage analysis, Chi-square test, correlation, and regression analysis were used for data interpretation.

1.7 Research Objectives

- To examine the industrial safety measures followed in FCS Fluoro Carbon Seals Pvt. Ltd.
- To find the significant association between demographic variables and employee safety perception.
- To assess the significant relationship between industrial safety measures and employee safety perception.
- To identify Industrial safety measures do not significantly influence employee safety perception.

2. DATA ANALYSIS AND INTERPRETATION

Table 2.1: Demographic profile of Respondents

Variable	Category	No. of Respondents	Percentage (%)
Gender	Male	34	34.0%
	Female	44	44.0%
	Transgender	4	4.0%
	Prefer not to say	11	11.0%
	Other	7	7.0%
Age Group	Below 25 years	8	8.0%
	25–35 years	31	31.0%
	36–45 years	36	36.0%
	46–55 years	16	16.0%
	Above 55 years	9	9.0%
Work Experience	Less than 1 year	14	14.0%
	1–3 years	22	22.0%
	4–6 years	24	24.0%
	7–10 years	23	23.0%
	More than 10 years	17	17.0%
Total		100	100%

The demographic profile of the respondents provides an overview of the sample characteristics considered for the study. A total of 100 respondents participated in the survey. The distribution of respondents based on gender shows that 44% are female and 34% are male, while the remaining respondents belong to other categories. This indicates a balanced representation of employees in the organization.

In terms of age group, the majority of respondents (36%) belong to the 36–45 years category, followed by 31% in the 25–35 years group. Respondents aged 46–55 years constitute 16%, while smaller proportions fall under below 25 years and above 55 years categories.

With respect to work experience, 24% of respondents have 4–6 years of experience, followed by 23% with 7–10 years of experience. About 22% have 1–3 years of experience, while 17% have more than 10 years of experience. This indicates that most employees have moderate work experience.

Overall, the demographic profile reflects a diverse workforce, which enhances the reliability and validity of the study findings related to industrial safety practices.

3. STATISTICAL TESTS

3.1 CHI-SQUARE TEST

Hypothesis:

H₀: There is no significant association between demographic variables and employee safety perception.

H₁: There is a significant association between demographic variables and employee safety perception.

Table 3.1: Chi-Square

Variable	p-value	Result
Gender	0.566	Not Significant
Age	0.856	Not Significant
Work Experience	0.756	Not Significant

Interpretation:

The Chi-Square test results show that the p-values for gender, age, and work experience are greater than 0.05. Therefore, the null hypothesis is accepted and the alternative hypothesis is rejected. This indicates that demographic variables do not significantly influence employee safety perception.

3.2 CORRELATION ANALYSIS

Hypothesis:

H₀: There is no significant relationship between industrial safety measures and employee safety perception.

H₁: There is a significant relationship between industrial safety measures and employee safety perception.

Table 3.2: Correlation Analysis

variable	Correlation
Safety Training	0.602**
PPE Usage	0.601**
Safety Policy	0.557**

Interpretation:

The correlation results show a positive relationship between safety training, PPE usage, safety policy, and employee safety perception. Since all values are significant, the null hypothesis is rejected. This indicates that better safety measures lead to improved employee safety awareness.

3.3 REGRESSION ANALYSIS**Hypothesis:**

H₀: Industrial safety measures do not significantly influence employee safety perception.

H₁: Industrial safety measures significantly influence employee safety perception

Table 3.3: Regression Analysis

Variable	Beta	Sig.
Safety Training	0.324	0.001
PPE Usage	0.282	0.005
Safety Policy	0.221	0.022

Interpretation:

The regression analysis shows that safety training, PPE usage, and safety policy have a significant impact on employee safety perception, as all p-values are less than 0.05. Among these variables, safety training has the highest influence. Therefore, the null hypothesis is rejected

Table 3.4: Model Summary

R	R ²	Adjusted R ²
0.698	0.487	0.471

Interpretation

The model summary shows that the R value is 0.698, indicating a strong relationship between industrial safety measures and employee safety perception. The R² value of 0.487 indicates that 48.7% of the variation in employee safety perception is explained by industrial safety measures.

Table 3.5: ANOVA

Source	F	Sig.
Regression	30.413	0.000

Interpretation

The ANOVA table shows that the significance value is 0.000, which is less than 0.05. Therefore, the model is statistically significant, indicating that industrial safety measures significantly influence employee safety perception.

Table 3.6: Coefficient

Variable	Beta	Sig.
Safety Training and Awareness	0.324	0.001
Personal Protective Equipment Usage	0.282	0.005
Safety Policy Compliance	0.221	0.022

Interpretation:

The coefficient table shows that all variables significantly influence employee safety perception, as the significance values are less than 0.05. Safety training has the strongest impact, followed by personal protective equipment usage and safety policy compliance. The results indicate that industrial safety measures significantly influence employee safety perception in the organization.

4. FINDINGS

The study reveals that the majority of employees are aware of the safety policies followed in the organization. Most respondents agreed that safety training programs are adequate and comprehensive, and employees demonstrated a good understanding of workplace hazards and safety procedures. The usage of personal protective equipment among employees was found to be satisfactory. The analysis results also indicate that industrial safety measures such as safety training, PPE usage, and safety policy compliance significantly influence employee safety perception. Furthermore, the Chi-square analysis shows that demographic

variables do not significantly influence employee safety perception. PPE usage among employees was found to have a significant positive relationship with employee safety perception.

5. SUGGESTIONS AND CONCLUSION

5.1 Suggestions

The organization should conduct regular safety training programs to improve employee awareness and knowledge regarding workplace hazards. Periodic refresher training sessions should be organized for all employees to enhance safety practices. Proper enforcement of personal protective equipment usage should be implemented across all departments. Safety awareness programs should be conducted frequently to promote a strong safety culture within the organization. Additionally, emergency drills should be conducted regularly to improve employee preparedness and response to workplace emergencies.

5.2 Conclusion

The study concludes that FCS Fluoro Carbon Seals Pvt. Ltd., Thuraiyakkam, has implemented essential industrial safety measures, including safety training, PPE usage, and safety policy compliance. The findings indicate that employees demonstrate good safety awareness and adherence to safety practices. The statistical analysis confirms that industrial safety measures significantly influence employee safety perception, while demographic variables do not have a significant association. However, improvements are required in areas such as continuous training, emergency preparedness, and hazard communication. Strengthening safety management systems and regular monitoring will enhance employee safety, reduce workplace risks, and improve overall organizational productivity.

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