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## DEVELOPMENT OF A SAFETY CULTURE MODEL FOR SMALL SCALE CONSTRUCTION ENGINEERING PROJECT

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### KEYWORDS

Safety Climate, Safety Culture, Safety Management, Safety Model, Snapshot, SPSS, Workplace Safety

### ABSTRACT

Construction Sector is very essential and an integral part of infrastructure development which gives tremendous boost to our country's economy. Safety plays vital role in the construction sectors which are widely used in the above sector. Safety Culture is the enduring value and priority placed on workers and public safety by everyone in every group at every level of an organization. Safety climate is a theoretical term used by safety and personnel professionals to describe the sum of employee perceptions regarding overall safety within the workplace. The objective of this thesis is to examine the current culture in the workplace regards to the management of safety and health and create a safe working environment for the small scale construction company. The methodology is briefly explained which includes various steps such as review of literature, data collection, SPSS software study, result analysis and developing Safety Culture model for small scale construction companies. A questionnaire is prepared based on many criteria such as accidents, safety in emergency period, safety information, workplace hazards, workplace risks, workplace health & safety, welfare and time regulations and finally about review. The Questionnaire prepared is circulated to many construction companies and data has been collected. The purpose of data collection is to obtain information to keep on record, to make decisions about important issues, or to pass information on to others. SPSS is a software package used for statistical analysis. Here descriptive statistics which includes Cross tabulation, Frequencies, Explore and Descriptive Ratio Statistics are done using the SPSS software and results are obtained. The results for the analysis are graphically represented in pie charts and bar charts for various criteria classified in questionnaire. The final conclusion is arrived based on the results and the model of safety culture for small scale construction companies has been developed.

## 1. Introduction

Construction Sector is very essential and an integral part of infrastructure development which gives tremendous boost to our country's economy. The construction industry has registered enormous growth worldwide in recent years. Although the development of technology is rapid in most of the sectors, construction work is still labour intensive, In India the construction sector employs around 33 million people, which is next to agriculture. Construction is unique compared to other industries. It has been repeatedly stated that each Construction project is different from another by presenting different situations and problems during its execution. Planning and execution under time and budget pressures, temporary workers with various skills, and works influenced by weather conditions and external environments are some characteristics that differs construction projects from projects in other industries. These characteristics make construction projects face hazardous conditions that are potential to cause accidents. Traditionally, safety in construction is the primary responsibility of general contractors and subcontractors, and not designers and construction managers.

## 2. Safety culture

The term first arose after the investigation of the Chernobyl nuclear disaster in 1986 which led to safety culture being defined as "an organisational atmosphere where safety and health is understood to be, and is accepted as, the number one priority". On this basis a more realistic definition may be "A safety culture is an organisational atmosphere where safety and health is understood to be, and is accepted as, a high priority". Safety culture is the ways in which safety is managed in the workplace, and often reflects "the attitudes, beliefs, perceptions and values that employees share in relation to safety". Safety Culture is the enduring value and priority placed on workers and public safety by everyone in every group at every level of an organization. It refers to the extent to which individuals and groups will commit to:

- Personal responsibility for safety
- Act to preserve safety
- Enhance and communicate safety concerns
- Strive to actively learn

## 3. Safety Climate

Safety climate is a theoretical term used by safety and personnel professionals to describe the sum of employee perceptions regarding overall safety within the workplace.

## 4. Key differences culture vs. climate

Safety Culture is commonly viewed as an enduring characteristic. Safety Culture is the attitudes, values, norms, and beliefs that a particular group of people share with respect to risk and safety. Safety Culture is a group of individuals guided in their behavior by their joint belief in the importance of safety. Safety Cultures build joint responsibility between individuals from management to employee. Safety Climate is viewed as a temporary state that is subject to change depending on current circumstance. Safety Climate can be defined as a "snapshot" of employee's perceptions of the current environment or prevailing conditions which impact upon safety. Safety Climate varies individually depending on current perceptions and can change daily. Perception of safety procedures and rules are a reflection of safety climate.

## 5. Objective & Scope

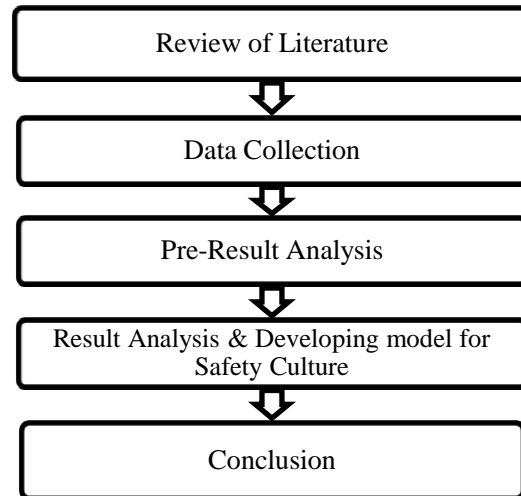
The objective is to examine the current culture in the workplace regards to the management of safety and health and to create a safe working environment for the small scale construction company.

The scope of this research is to maintain a safe working environment, to minimize our environmental impact, to promote a culture of responsibility for our environment, health, and safety

## 6. Investigation Methodology

The above said methodology is for developing a safety culture model in small scale construction companies. The detailed methodology can be explained as follows:

- Data collection
- Questionnaire survey
- Analysis using SPSS Software
- Safety Culture Model Preparation



**Fig.1 Methodology of the project**

### **6.1. Data Collection**

Data collection is any process of preparing and collecting data, for example, as part of a process improvement or similar project. The purpose of data collection is to obtain information to keep on record, to make decisions about important issues, or to pass information on to others. Data are primarily collected to provide information regarding a specific topic. Data collection usually takes place early on in an improvement project, and is often formalised through a data collection plan which often contains the following activity.

- Pre collection activity - agree on goals, target data, definitions, methods
- Collection - data collection
- Present Findings - usually involves some form of sorting analysis and/or presentation.

### **6.2. Questionnaire**

A questionnaire is a research instrument consisting of a series of questions and other prompts for the purpose of gathering information from respondents. The Questionnaire is prepared based on the criteria such as Accidents, Safety Policies, Fire Precautions and Emergency Evacuation, Information, Instruction, Supervision, Training and Consultation, Workplace Hazards, Workplace Risks, Workplace Health and Safety, Welfare & Working Time Regulations, Review

### **6.3. Analysis using SPSS Software**

SPSS provides facilities for analyzing and displaying information using a variety of techniques. This document uses version 20 of SPSS for Windows 7. Here are a few things that will be included in “The basics of Statistics” section.

- Mean, variance, Standard deviation, descriptive statistics
- One sample Statistics
- Produce bar charts
- Paired sample correlations

### **6.4. Safety Culture Model Preparation**

Based on the various literature study and data survey result from several construction companies the safety culture model for the small scale companies is framed. This safety culture model will provide the safety management system to be followed by the small scale companies which facilitates safe work environment.

## 7. CONCLUSIONS

The main conclusions drawn from the thesis are given below with respect to the following factors.

- i. In **accidents** only 14.1% of construction industry maintains safety first aid kit and others doesn't due to
  - The safety practices are not followed by the construction companies.
  - Funding for the safety measures is not sufficient.
  - Lack of improving the standards of work in systematic manner.
- ii. In **safety in emergency period** only 12.1% of construction industry maintains precautionary measures
  - Safety policies of the companies are not displayed.
  - Fire precautions should be taken before the accidents
  - Emergency evacuation is not done.
- iii. In **safety information** only 12.4% of construction industry maintains precautionary measures
  - Process of Risk Assessment should be done.
  - Written H&S information should be displayed.
  - Refresher training for workers to be done.
- iv. In **Workplace Hazards** only 11.59% of construction industry maintains precautionary measures
  - Mechanical Ventilation should be provided.
  - Handrails to the staircases to be provided.
  - Lifting equipment such as cranes lift are to be tested and serviced regularly.
- v. In **Workplace Risks** only 12.84% of construction industry maintains precautionary measures
  - Windows and doors opening should be provided and maintained.
  - Equipment used should be serviced and maintained properly.
  - Safe work system is to be provided for doors and windows cleaning.
- vi. In **Workplace Health & Safety** only 12.1% of construction industry maintains precautionary measures
  - Worker moving equipment should be taken care and safety should be ensured.
  - Computer usage more than 2hrs continuously should be minimized.
  - Waste bins should be placed and cleaned regularly on time.
- vii. In **Welfare & Working Time Regulations** only 11.74% of construction industry maintains precautionary measures
  - Safe drinking water should be provided all time to workers.
  - Employee awareness should be created.
  - Restrooms should be maintained cleanly.
- viii. In **Review** only 13.1% of construction industry maintains precautionary measures
  - H&S polices are not displayed.
  - H&S training and records are not maintained.
  - Workroom ventilation should be done.

## References

- [1] Abdelhamid, T.S., Narang, P., Schafer, D. (2011). "Quantifying Workers' Hazard Identification Using Fuzzy Signal Detection Theory." *The Open Occupational Health & Safety Journal*, 2011, 3, (Suppl 1-M3), 18-30.
- [2] Abudayyeh, O. et al., (2003), 'Analysis of Occupational Injuries and Fatalities in Electrical Contracting Industry', *Journal of Construction Engineering and Management*, 129(2), pp. 152-158.
- [3] Cooper, M.D (2007) 'Evidence from Safety Culture that Risk Perception is culturally determined', *The International Journal of Project & Business Risk Management*, Vol 1(2), 185- 202.
- [4] Guldenmund, F. W. (2000) The nature of safety culture: a review of theory and research *Safety Science*, 34, 215-257.
- [5] Mearns, K., Whitaker, S. M. & Flin, R. (2003) Safety Climate, safety management practice and safety performance in offshore environments *Safety Science*, 41, 641-680
- [6] Neal, A., & Griffin, M. A. (2004). Safety climate and safety at work. In J. Barling & M. R. Frone (Eds.), *The psychology of workplace safety* (pp. 15-34). Washington, DC: American Psychological Association.
- [7] Reason, J. (1998) Achieving a safe culture: theory and practice *Work and Stress*, 12, 293-306.
- [8] Yule, S. (2003) Safety culture and safety climate: a review of the literature. *Industrial Psychology Research Centre* 1-26.