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Safety and Quality Issues in Construction Industry

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Abstract - Construction industry is considered as the most hazardous industry due to its unique nature. Safety and quality management are essential to control hazards and improve success in project implementation. This project focuses on evaluating the crucial factors influencing safety and quality management in construction projects. In order to achieve this, the qualitative and quantitative approaches were used for data collection. The findings of this study reveal the crucial safety factors as management commitment, safety awareness of top management practices/ procedures/ reviews, and errors in judgement or carelessness. Project supervision, employee involvement/ attitude, and expertise knowledge/ training were considered as the crucial quality factors influencing safety and quality management. The study shows that safety and quality issues cannot be overlooked therefore proper implementation is paramount to achieve project success.

Key Words: PPE-Personal Protective Equipment, Questionnaire, Safety, Quality and QC

1. INTRODUCTION

Quality control and safety represent increasingly important concerns for project managers. Defects or failures in constructed facilities can result in very large costs. Even with minor defects, re-construction may be required and facility operations impaired. Increased costs and delays are the result. In the worst case, failures may cause personal injuries or fatalities. Accidents during the construction process can similarly result in personal injuries and large costs. Indirect costs of insurance, inspection and regulation are increasing rapidly due to these increased direct costs. Good project managers try to ensure that the job is done right the first time and that no major accidents occur on the project.

1.1 Organizing for Quality and Safety

A variety of different organizations are possible for quality and safety control during construction. One common model is to have a group responsible for quality assurance and another group primarily responsible for safety within an organization. In large organizations, departments dedicated to quality assurance and to safety might assign specific individuals to assume responsibility for these functions on particular projects. For smaller projects, the project manager or an assistant might assume these and other responsibilities. In either case, insuring safe and quality construction is a concern of the project manager in overall charge of the project in addition to the concerns of personnel, cost, time and other management issues.

1.2 Scope of Project

Safety management in the construction industry helps to identify the risks and reducing accidents to improve site productivity and project. While in quality management it helps to produce good quality products to work in the construction industry. Sometimes quality products control the accidents in construction site. In this project, it explains about the safety and quality issues in construction industry and how to rectify from the accidents and to produce good quality products. This Project proposes to investigate the adoption and implementation of QMS and SMS in the construction industry and develop a “measurement methodology” of construction process for customer satisfaction and continuous improvement. The main concept of this project will be to identify “what” processes can be measured and “how” to measure them. To identify the above objectives literature search and questionnaires will be uses. For the local construction industry, this project helps to use of safety measures in construction industry and use of good quality products and produce good infrastructure for the buildings.

1.3 Objectives

The main objective of this study is to create the safety and quality awareness to the construction company especially for small scale industries. Because all the literature and statistics shows that small scale construction industries not that much aware of Safety Management System (SMS) and Quality Management System (QMS). Whenever the Quality Management System is implemented, we can easily minimize the wastage of material, cost overrun, wastage of time, etc... While safety management system is implemented we can easily reduce the accidents where occurring in the construction sites.

2. METHODOLOGY

`The methodology is designed in order to reflect the different aspects of construction sites and to reflect overall project objectives.

As the first step, a detailed questionnaire will be designed in order to quantify the criteria influencing the safety at site with weight-age depending upon its importance.

In the next two steps, the questionnaire will be distributed and filled questionnaire is collected back from respondents. A total of 30 interviews will be conducted across 2 sites with a range of managers, site engineers, personnel responsible for safety, and labourers.

In the last step, findings based on the questionnaire and interviews will be used to analyse the safety performance of the construction industry.

3. SAFETY AND QUALITY ISSUES IN CONSTRUCTION

Persons working in construction sites should wear personal protective equipments for their safety. Most of the small construction companies generally not aware of safety protection equipments because of the cost of materials and time consumption at the beginning of every day starting of work for fixing the safety nets and using other safety equipments. The following fig. shows the basic safety protection that should be worn by workers at construction sites.

3.1 Major hazards and risks

The main hazards and risks of accidents in the construction sector can be categorised and described in the following way:

- risks of slips, trips and falls
- risks related to instability
- risks related to traffic
- risks related to construction machinery

- risks of drowning
- risks related to electricity
- risks related to gas
- fire and explosion risks
- asphyxia risks
- risks related to green jobs.

3.2 Causal influences in construction accidents

Construction accidents related to the abovementioned hazards and risks, will arise from a failure of different factors. One of the main problems with construction safety is, for example, that hazards in a construction site may change from day to day. In addition, many workers will go from site to site where they will be exposed to different hazards or where hazards are being managed differently.The following four interlinked factors give rise to the 'immediate accident circumstances':

- worker and work team ('shaping factors': worker actions and behaviour, capabilities, communication, health, and available supervision);
- workplace ('shaping factors': site conditions and layout, work environment, work scheduling, and housekeeping);
- materials ('shaping factors': material suitability, usability, and condition);
- equipment ('shaping factors': equipment suitability, usability, and condition).

These immediate causing factors of construction accidents, are influenced by some organisational, managerial and design factors (i.e. 'root causes'): construction design and processes, project management, risk management, client and economic influences, and safety culture, training and awareness.

Safety and Quality Issues and its solutions

1. Allergic reaction when using body harness for long working hours is not the reason for avoidance. (17/30 persons)
2. Workers feel no pain when using complete PPE suit for long working hours.(21/30 persons)
3. Workers feel headache while using earmuff. (18/30 persons)
4. Workers feel pain in the neck when using hardhats for long working hours. (22 / 30 persons)
5. Workers not Concentrating during work is the reason for poor quality issues in construction.(27 / 30 persons)
6. For Customer Economical Construction results in low quality issues in project.(30 / 30 persons)
7. Workers' lack of knowledge about PPE is the reason for avoidance. (25 / 30 persons)
8. PPE is essential for protecting workers against damaged in the workplace.(30 / 30 persons)

9. PPE is not the last level of hazard control in the construction site. (19 / 30 persons)
10. Wearing PPE increases risk of heat stress (21 / 30 persons).
11. Employer provides appropriate PPE required.(25 / 30 persons).
12. Unskilled Engineers and Workers result in quality issues in construction site.(30 / 30 persons).
13. Workers is not responsible for lost or damaged PPE.(23 / 30 persons).
14. PPE is cleaned before storing in construction site. (28 / 30 persons).
15. Engineers are always checking PPE for damage before and after use it. (20 / 30 persons).
16. Shortage of PPE is highly influencing worker safety. (21 / 30 persons).
17. Ability level of PPE against workplace hazards is important factor. (23 / 30 persons).
18. PPE creates barrier between hazard & route of entry. (17 / 30 persons).
19. The weights of PPEs are too heavy. (16 / 30 persons).
20. The PPEs size is suitable for the many of workers. (21 / 30 persons).
21. Unskilled labourers dislike to wear PPE many times(28 / 30 persons).
22. Lack of understanding about importance of PPE is the major cause. (25 / 30 persons).
23. Lack of safety training for PPE is not the reason for avoidance. (19 / 30 persons).
24. Workers under the influence of alcohol and drugs are avoiding PPE in most of the time. (24 / 30 persons).
25. The PPE is tested constantly for its function before use in the construction site. (20 / 30 persons).
26. The number of accidents at the construction site had been reduced due to usage of the PPE. (25 / 30 persons).
27. The supervisor has the rights to randomly check on the maintenance of the PPE for the workers. (29 / 30 persons).
28. Experience of difficult incidents or accidents while using PPE is the reason for avoidance. (21 / 30 persons).
29. Workers are not willing to wear PPE for longer than two hours because Heat & dehydration were a major issue. (22 / 30 persons).
30. The workers are not fined or punished for not wearing the PPE in the construction site. (28 / 30 persons).
31. The supervisors encourage workers to wear PPE at the construction site. (21 / 30 persons).
32. The organization is periodically disposed of and replaced the damaged PPE. (23 / 30 persons).
33. Workers Never deliberately misuse or damaged PPE. (27 / 30 persons).
34. Workers must be trained to fit and use each items of PPE correctly. (21 / 30 persons).
35. PPEs are used correctly by employees. (26 / 30 persons).
36. PPEs were properly assessed before use to ensure it is suitable. (21 / 30 persons).
37. Workers' vision is not affected while they wearing eye protection. (22 / 30 persons).
38. Workers feel discomfort for breathing and talking while they wearing noise and mouth protection. (25 / 30 persons).
39. Workers didn't felt discomfort with their gloves while working. (21 / 30 persons).
40. Workers didn't felt irritating while wearing body protection suit. (20 / 30 persons).
41. Workers feel weight of body suit as discomfort. (24 / 30 persons).
42. The purpose of each item of PPE must be explained to workers. (28 / 30 persons).
43. Engineers need to consider and assess to select the correct PPE. (20 / 30 persons).
44. Workers are interested to wear ear plugs in a high level noise environment. (28 / 30 persons).
45. Irritation in the skin while wearing the gloves and boots is not the reason for avoidance. (21 / 30 persons).
46. Supervisors review work practice to make sure employees wearing PPE when required. (20 / 30 persons).
47. The organization replaces the damaged PPE at no cost of workers. (29 / 30 persons).
48. Nose and throat irritations while wearing safety mask are not the major issues. (21 / 30 persons).
49. Cost of employee benefits arising directly from the construction or acquisition of the PPE. (20 / 30 persons).
50. Workers feel difficulties to breath when wearing the respirators. (19 / 30 persons).
51. Respirators decreased the hearing ability to workers. (23 / 30 persons).
52. Respirators decrease the voice clarity of workers when wearing it. (22 / 30 persons).
53. Each and every month the organization arranges the safety meeting for workers. (18 / 30 persons).
54. Each and every month the organization investigates the safety inspection for PPE. (21 / 30 persons).
55. Each and every worker used PPE in all working days. (25 / 30 persons).
56. Awareness of PPE leads to improve the safety climate in construction sites. (26 / 30 persons).
57. Lack of availability of PPE is the major issue in construction sites. (16 / 30 persons).

4. QUESTIONNAIRE SURVEY

The following sequence of issues are obtained from analysing the questionnaires given to the persons in site regarding safety and quality issues in construction industry and the solutions to the problem have been found out.

Questionnaire survey are taken from 30 different individuals in two different sites.

1. Avadi Engine Factory Site

2. Vichoor Pentagon Building Construction Site

From the analysed Questionnaire survey, the following things have been found out in this site.

From finding various factors affecting the safety in construction site by above method, we can deduce the solutions simply by doing the opposite things to the factors which causes the safety and quality issues in construction site.

5. CONCLUSIONS

This Thesis concludes that the use of PPE (Personal Protective Equipment) plays an important role in safety in construction industry .

This Thesis also states that the skills of labours, Engineers, Project Managers and other working persons also plays an vital role in safety and quality issues in construction industry.

Findings based on the questionnaire and interviews are used to analyse the safety performance and Quality Issues of the construction industry.

The result of this thesis will expose the main factors which affect the construction safety and quality and also expose the increase in cost of construction due to safety and quality defect.

This study will create the quality and safety management awareness to all level construction companies.

This Thesis will be helpful in finding the remedial measure for the factors and issues which affect the construction safety and quality

This Thesis will be useful for minimizing the material wastage, workmanship wastage, time wastage and indirect cost

Good Quality construction increases the customer satisfaction and company reputation.

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