

Safety and Emergency Management in Construction Industry

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ABSTRACT: This paper explores the various safety and control measures (SCM) of accidents in building projects to minimize accidents' occurrence and consequent waste generation. A research methodology, consisting of a literature review and a field study were used to achieve the research objectives. The field survey involves a designed questionnaire that was administered through convenience sampling technique within Lagos State and descriptive analysis tools were used for the analysis. The field survey reveals different control measures in place and their rate of usage on building projects. On the other hand, the literature survey sheds light on the types of accidents on building projects and their respective control measures with methodologies for accidents' preventions. Recommendations based on the findings of the two surveys are outlined in the paper.

KEYWORDS : Cost Saving, Excess, Overrun.

I. INTRODUCTION

Over the past few years construction work has been increasing in both developed as well as developing countries. In developing countries, safety rules usually do not exist if they do, their regulatory authority is usually very weak in implementing such rules effectively. India is mainly an agricultural based country but nowadays the construction industry stands next to agriculture. Construction jobs are very risky as compared to others from a safety point of view because safety on construction sites has been ignored by many construction industries especially where labour forces are mainly important. The disturbing thing in construction work is the number of fatalities occurring. This is mainly due to a lack of knowledge regarding work even the training or safety during the work. This lack of knowledge and safety leads to major and serious accidents. The risk of injuries in the construction industry is very high mainly because of the nature of the work carried out by different agencies employing largely unskilled workers. Due to an increase in the number of accidents and injuries reported on construction projects, safety is becoming more important today in the construction industry. Hence, management of safety and emergency plays an important role in the construction industry. Construction accidents can be minimized by finding out the root cause of accidents by the investigation techniques such as cause of accident and human errors. In most of the construction industry, the cause of accident is poor implementation of provisions which are made to avoid accidents. It is important to have a safe construction site for the workers performing their tasks.

Emergency and safety are relevant to all branches of industry, it is particularly important for the construction industry. It has always been a major issue as it is considered as among the most exposed sectors when it comes to occupational accidents. Although tremendous improvements have been made in health and safety performance in some countries, the construction industry continues to lag behind most other industries. This has been the experience within most countries. There is a fact that the construction industry continually has injury and fatality statistics that make it one of the most dangerous industries in which to work predominantly in developing countries.

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Maintaining good quality of work is one of the main objectives of safety and emergency management. In addition, economy or cost of project is one of the major factors considered when determining success of project. So the number of incidences among construction labor and level of awareness matter concerning safety of workers. The aim of safety and emergency management is to reduce accidents, improve productivity, improve human relations and enhance firm image.

Therefore, it is essential for any construction project to have certain safety guidelines and procedure to be followed for site activities and to create awareness among the workers, site supervisor and engineers.

II. ADVANTAGES AND DISADVANTAGES

Accidents in construction sites are unplanned incidences involving movement of persons, objects or materials which result in injuries, damages and losses to properties or people and to reduce these proper safety and emergency management is needed in construction industry. On sites accidents so occur due to unsafe conditions, unsafe act and beyond human controlling construction industry lot of companies are having the safety management but every company is not using the modern techniques. But just they are carry basic safety management. Small projects are not working with respect to safety and emergency management which causes the Major number of accidents but the large projects are working by using safety and emergency techniques which results the less amount of accidents.

In construction sector the lot of crowd discusses or connected from rural area, so the raise lack of knowledge regarding the safety and regarding the training and the seared woman factors which are cause for the accidents. Apart from those lacks of Motivation, Lack of knowledge about safety in workers, Noose of Personal protective equipment, Communication problems are some main safety management problems occurred in small scale evening large scale construction industries. So training should be given according to their requirements on site to workers. If some techniques of safety and emergency managements are use it can prevent major loss that is loss of human life, health loss and economical loss.

III. SIGNIFICANCE OF RESEARCH

The importance of the research stems from the need to develop an understanding and investigate the problem of emergency and safety management in construction in the India and make a contribution to knowledge in this area where very little information exists. Addressing safety issue should not be seen as regulatory burdens it offers significant opportunities and benefits to the construction companies.

Such benefits include: reduced risks in the workplace, less absences by employees and hence increased productivity, fewer accident and less threats legal action, improved standing among clients and partners, and obviously reduced costs to the business. This research offers a best practice guide to emergency and safety management in Indian construction companies.

IV. LITERATURE REVIEW

Mr.Rahulb. Kesarkar, Prof. Nikhil bhalerao, Prof.P.R.Mind. (September 2016)

From the construction of building simple structures, roads, and minor civil work projects, the construction industry has change significantly over the last few decades. Safety on construction job site has been ignored by construction companies worldwide and particularly in countries where the labor force is required. Due to increasing numbers of reported accident and injuries safety is becoming an important issue in construction environment; also safety is usually discarded by its operator. The importance of safety and health in construction and high lights the factors affecting safety on construction projects. The benefits of safety and health improvement include: reduced accident costs, increased productivity, improved human relations and enhanced firms image.

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T. Subramani and R. Lordsonmillar. (June 2014).

Construction in developing countries such as India is more labor-intensive than that in the developed areas of the globe. In numerous developing countries such as India, there is a significant difference between large and small contractors. Most large firms do have a safety policy, on paper, but employees generally are not aware of its existence. Never the less, a number of major constructors exhibit a concern for safety and have established various safety procedures. They also provide training for workers and maintain safety person near the job site. One method that may bemuse to increase site safety is to involve employees in developing a safety program. Many employees are aware of significantly more field hazards than their employer sand can suggest ideas which will reduce accidents. In addition, by involving employees in planning, safety orientation, and training process, they become aware that they are executing their own safety program. Also, individuals may be recognized form a intoning a good safety record.

V. OCCURRENCE OF EMERGENCY ON SITE

Modern industry and technology is open to an ever increasing danger form disasters, which can seriously affect the safety, security and stability of the organization. Some of these disasters are natural such as earthquakes, floods, tsunamis, cyclones, lightning, while others are man-made. The man-made disasters included dangerous spills & leak of chemicals, fires & explosions, hit by external objects, contamination & poisoning of food, terrorist attacks, etc. All of these have occurred several times in industries, when unprepared for such disasters creating panic, disorder and confusion. The result has been extensive damage to men and material. Major accidents/disasters in a factory are one which has the potential to cause serious injury or loss of life. It may cause extensive damage to property, loss of life and serious disruption both within and outside the works. An emergency plan is an informative document, which acquaints the occupants of a factory or occupancy with procedures to be implemented, during an emergency

VI. NEED OF MANAGEMENT

We cannot predict the exact frequencies of accidents where there is no historical backup. Emergencies are sometimes predictable or unpredictable. Accidents are the direct results of unsafe activities and conditions, both of which can be or cannot be controlled by management. Emergencies are occurred due to: 1)God action-flood, earthquakes, tsunami etc. 2) Human activity-faulty designs, difference in casting and designs, improper form work etc. 3)Ill fact process of construction-faulty drawing, unskilled labors, low rate labors and material used, casting done by using some thumb rules etc.

In current ways of handling emergencies Employees supplied with protective equipment while working on a construction site. This is particularly important when they are doing work on critical sites like bridge, tunnel compromised by an accident or natural disaster. There are some emergency precautions are now day stake non the different sites are: nets are designs for emergencies for particular loading, ambulance, emergency number services, spare JCB, easy ways, bunker boxes, fire exits and lifts, designed pulley chains etc.

VII. GENERAL SAFETY SUGGESTION for CONSTRUCTION INDUSTRY

1. We a personal protective equipment like safety helmet, safety shoes, safety goggles, hand gloves etc. as required and without exception.
2. Good housekeeping must be maintained to the maximum possible extent. A clean area of working is always a safe place to work. All roads, passage, walkways must be always kept clear off materials.
3. Anyhazardsunsafeconditionnoticedthenitshouldbereportedtothesupervisororforimmediateactiontaken.
4. Watch your footing to avoid slips, falls.
5. Report all incidents even if minor in nature.
6. Do not go the site of fire or accident unless you are instructed.
7. Keep your self alert especially around operating equipment and machinery.
8. Conduct tool box talks daily for workmen.

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9. Never use drums, concrete blocks as parts of scaffolding.
10. Never carry sharper pointed tools in our pockets.
11. Drinking alcohol must be prohibited.
12. Keep working area free of loose materials.

VIII. RESULT AND DISCUSSION

CONTROL MEASURES OF ACCIDENTS ON SITES.

Table 5.1 shows the response to the provision of safety control measures of accidents on sites. It can be observed that 15 of the respondents (76.5%) claimed total ways provide control measures of accidents to workers on site, 8 respondents (23.5%) provide it sometimes while none claim to never providing it. This shows that, some construction organizations know the importance of controlling or preventing occupational accidents among workers onsite and also value the life of their workers but in other cases it is only on paper.

Table No. 5.1: Provision of Control Measures of Accident on sites.

	Provision of control measures on sites	Frequency	Percent
1	Always	15	76.5
2	Sometimes	8	23.5
3	Total	23	100

Table No. 5.2: Different Control Measure of Accidents used on sites.

NO.	CONTROL MEASURES/FACTORS	$\sum W$	A*N	RII	RANKING
1	First aid center at site?	75	75	1	1
2	First Aid Centre equipped with the required medicines and accessories?	73	75	0.97333	2
3	Qualified doctor/nurse available on site?	30	75	0.4	9
4	Any arrangement with hospital for emergency treatment?	60	75	0.8	7
5	Team trained in emergency response procedures?	60	75	0.8	7
6	Emergency telephone numbers displayed?	75	75	1	1
7	Emergency vehicle/ ambulance available onsite?	74	75	0.98667	2
8	Mock drills conducted at regular intervals?	45	75	0.6	8
9	Sufficient lighting at the entrance?	48	75	0.64	8
10	Special storage areas for petrol, flammable materials, explosives etc.?	47	75	0.62667	8
11	Access roads suitable or the movement of plant and vehicles?	65	75	0.86667	7

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12	Walkways clearly defined and unobstructed?	69	75	0.92	6
13	Materials and equipment stored properly?	60	75	0.8	7
14	Adequate lightings provided for worker as and passages?	60	75	0.8	7
15	Toilets regularly cleaned?	44	75	0.58667	8
16	Adequate water supply for sanitation?	50	75	0.66667	8
17	Everyone wearing safetyshoes while onsite?	70	75	0.93333	5
18	Workers wearing suitable hand gloves while handling rough objects, chemicals etc.?	71	75	0.94667	4
19	Workers wearing full body safety harness while working at heights?	72	75	0.96	3
20	PPE regularly inspected for their good condition?	68	75	0.90667	6
21	Proper lifting accessories for manual handling provided?	60	75	0.8	7
22	Materials stored in an orderly manner?	58	75	0.77333	7
23	Material protected from weather and rain?	68	75	0.90667	6
24	Method statement made for excavation?	74	75	0.98667	2
25	Excavation permit taken where needed?	75	75	1	1
26	Excavations sloped/step back or shored properly?	66	75	0.88	7
27	Safe access provided for vehicles in excavation area?	58	75	0.77333	7
28	Excavation edge free from falling material?	69	75	0.92	6
29	Entry of water into the pits checked and controlled?	71	75	0.94667	4
30	Workmen trained to work inside confined space?	69.5	75	0.92667	5
31	Register maintained to enter the names while entering and leaving the confined space?	71.5	75	0.95333	3
32	Proper communication system for the person working inside the confined space?	72.6	75	0.968	3

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33	Scaffolds designed as per the load requirement?	69.5	75	0.92667	5
34	Scaffolds erected under the supervision of trained person?	58.5	75	0.78	7
35	Red / Greentags attached as per the conditions of the scaffolds?	51	75	0.68	8
36	Welders using required PPE?	70	75	0.93333	5
37	Proper electrical connection for the vibrators?	73.5	75	0.98	2
38	Workers using PPE at the time of concreting?	68.4	75	0.912	6
39	Hand tools in good working condition?	69	75	0.92	6
40	An operator using required PPE while working?	69.5	75	0.92667	5

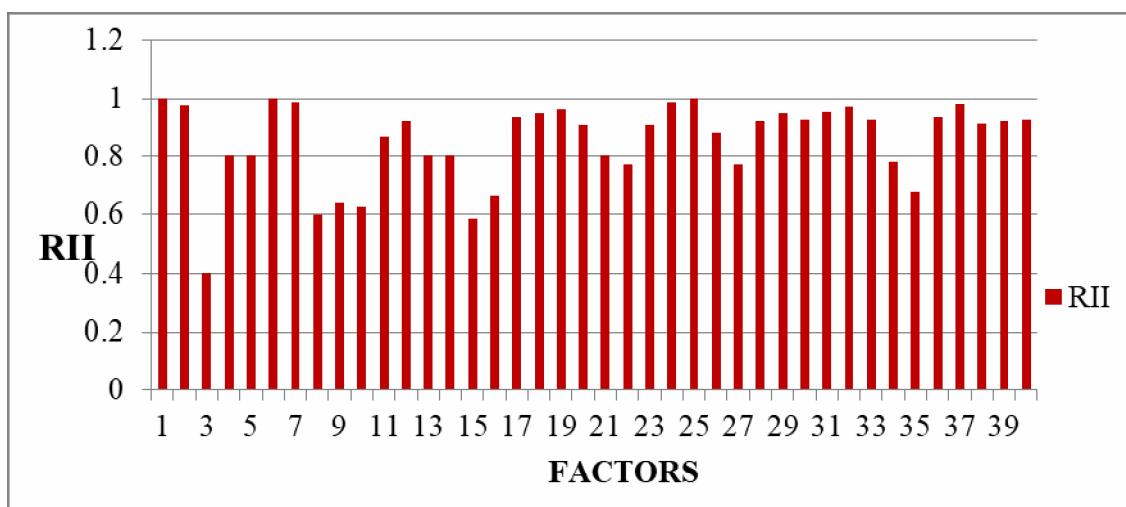


Table 5.2 and figure 5.1 shows the different control measures of accidents used on building sites and precast industry as reported by the respondents.

It can be shown from this Table that hard hat and first aid facility are of top priority as control measures of accidents on site. Hard hat or helmet are provided to prevent being struck on the head by falling objects or materials while first aid services are provided to give first hand treatment to any injury sustained on site, so as to limit its fatality before proper hospital attention is given. Protective cloth, traction boots and hand gloves follow these dissimilarly. Traction boots are provided to prevent any step-on or slip accident while hand gloves are provided to protect the hand from direct contact with energized cable or circuit, sharp objects or materials, etc. Next are usage of signs, guides, caution and reflectors to give signal of danger ahead to any one approaching; eye wear; and protective equipment. This shows that protective equipment is not of top priority as control measures of accidents. Provision of safety net on scaffold is least used among other measures as control measures of scaffold accident. Though, it is issued to prevent falling-off of workers, tools or materials from a scaffold, its usage is not common on site in Lagos state. Despite the varying usage of these measures, all of the respondents signified all the control measures as a means of controlling accidents on sites.

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IX. CONCLUSION

In construction industry lot of companies are having the safety management but every company is not using the modern techniques but just they are carry a basic safety management. By studying out my survey only one company have good safety and emergency management and onecompany is not using a single thing for the safety as well as for the emergency. By the opinions of the entire visited site shay need an advanced guideline model for minimizing the accidents

By the survey of sites we found that the companies which are using the SM are not that much effective and only 50-55% implementation of safety method is complete on construction site. Near about 30% major and 70% minor accidents are occurs on sites. On sites the accidents are occurred due to unsafe condition, unsafe act and beyond humancontrol.

The study reveals:

- The various types of accidents that exist on construction sites and their respective control measures.
- Several accidents' prevention methodologies.
- The types and frequency of usage of accidents' control measures on sites.
- That helmet, first aid services, protective clothes and traction boots are the most used safety measures onsite, though their usage differs from site to site.
- A safety officer, different from the site engineer or manager, should be employed on site to specifically plan, monitor and ensure adherence to control measures on site to minimize accidents' occurrence and waste.
- First aid facility and attendant should be made available on site at all time.
- The use of safety equipment or control measures of accidents should be highly enforced on all workers on site. Warning signs, guides or reflector should be displaced where necessary on site

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