ISSN (Online) : 2319 – 8753
ISSN (Print) : 2347 - 6710

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization, Volume 3, Special Issue 1, February 2014

International Conference on Engineering Technology and Science-(ICETS'14)

On 10th & 11th February Organized by

Department of CIVIL, CSE, ECE, EEE, MECHNICAL Engg. and S&H of Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

A Study on Construction Jobsite Safety Management

AV.PRAVEEN KUMAR, *CK.*VISHNUVARDHANM.E.,

II Year M.E., (CEM), Department of Civil Engineering, Kongu Engineering College, Erode-638052, Tamilnadu, India
Assistant Professor, Department of Civil Engineering, Kongu Engineering College, Erode-638052, Tamilnadu, India

I.INTRODUCTION

1.1 GENERAL

Jobsite safety management refers to the cyclic process of planning implementing and reviewing, control of work and manpower to reduce the accidents. At the start there is no importance for jobsite safety management. Years to go quantification of work levels involved in the project goes to a maximum, which makes the project jobsite safety management more important. A safety management provides a systematic way to identify hazards and control risks while maintaining assurance that these risk controls are effective.

In India, construction industry holds the second position next to agriculture industry. The annual turnover of the construction industry in India is about 4000 Billion Rupees, which is more than 6% of the National GDP employing a large work force. The number of fatalities occurring from construction work in the industry is quite disturbing and fall of person from height and through openings are the major causes for serious accidents. But the accidents occurring in India is very high compared to the foreign countries with strong planning, effective implementation and continual training with focused safety management a good safety record could be achieved comparable to international level.

PROBLEM STATEMENT

In India the building industry is developing by varying technologies. But Poor working conditions, the involvement and the need for coordination of different activity, and improper safety measures affecting the jobsite safety management. Safety is a serious problem in the construction industry. In recent years, safety records in the construction industry are so worse that becomes a big issue which affects the labours jobsite safety condition.

DEFINITION OF JOBSITE SAFETY MANAGEMENT

Safety can be defined as the absence of danger from which harm or loss could result or "freedom from hazards". However, it is practically impossible to completely eliminate all hazards. Therefore a matter relative protection from exposure to hazards present in construction jobsite. Jobsite safety management, like many other management activities, consists of planning, organizing, controlling and communications.

Planning

Planning is essential to the ongoing success of any project and the components of the project, including safety. A well-planned operation involves a series of deliberate steps. First, the safety practitioner must forecast the needs of safety department for the coming year. This involves reviewing the records of successes and failures as well as all the resources used in the past. This forecasting of coming need or predicting when will occur is a result of looking at the past and studying the future.

Organizing

Safety usually operates from a purely staff position. The line engineer/site inchargehas the responsibility to make the foreman to understand the safe work condition and make them to do safe performance.

Controlling

Controlling occurs through a number of sub functions. It involves looking at what is happening in the organization by monitoring, comparing the results of the observations to establish standards, and then taking appropriate corrective actions. This occurs through inspections, audits, records reviews,

ISSN (Online) : 2319 – 8753
ISSN (Print) : 2347 - 6710

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization, Volume 3, Special Issue 1, February 2014

International Conference on Engineering Technology and Science-(ICETS'14)

On 10th & 11th February Organized by

Department of CIVIL, CSE, ECE, EEE, MECHNICAL Engg. and S&H of Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

interviews with employees and supervisions, and a careful watch on what is happening in the organization.

Communication

The ability to communicate effectively is critical to the success of safety practitioners. They must be able to speak in terms that the jobsite in charge or safety engineer can understand. This requires knowledge of accounting, economics, and modem production and quality theory. Strong human-relations skills and related language ability are important to any successful safety effort. The safety practitioner will be working with top management and front-line workers. He needs to have the personality and ability to relate to both groups effectively.

EXISTING SAFETY MANAGEMENT STRATEGIES

Besides elevated OSHA safety regulations and standards, various safety management strategies and programs have been applied in construction to improve jobsite safety performance. BBS (Behaviour-Basedsafety) is one of the most widely used strategies. According to it 95% of all workplace accidents are caused by unsafe acts, most of which are man failures. Thus workers at risk behaviors become the focal area of safety management. For example, Lingard and Rowlinson implemented BBS to improve a jobsite safety records by inspecting pre-established safety behaviors related to housekeeping, access to heights, bamboo scaffolding, and personal protective equipment (PPE). Although BBS is sometimes criticized for long duration, high cost, and short-term effects on behaviour shift.Industry surveys have shown positive outcomes from applying BBS to reduce construction incidents and changing behavior and attitude.

SMALL CONSTRUCTION FIRM

The small construction firms are characteristically one in which most of its products is unique with respect to form, size, and purpose as like big construction firms. Whereas they are not unique, work operations, which are similar and repetitive, are often executed in work environments which change from hour to hour due to several factors such as weather conditions, locations, and height. Construction workers are constantly expected, therefore, to familiarize themselves with new situations that may be potentially hazardous. Small construction firm is often severely affected by natural phenomena such as changing weather and climatic conditions. The working environment that not constant and varies may produces several hazardous situations.

LABOUR SAFETY CONDITON

About 25.71 million building and other construction workers are estimated in India as per estimates of National Sample Survey (2004-2005).The building and other construction workers are one of the most vulnerable segments of the unorganized sector workers in India. Their work is of temporary nature, the relationship between employer and employee is temporary, working hours are uncertain. The construction workers are basically unskilled, migrant, socially backward, uneducated with low bargaining power. Provisions of labour laws like Minimum Wages Act, 1948; Workmen's Compensation Act, 1923; Contract Labour (Regulation & Abolition) Act, 1970; Inter-State Migrant Workmen Act, 1979 etc. are applicable to building and other construction workers. The working conditions and the facilities provided at the sites are far from satisfactory. Most of the companies do not even provide safety belts, protective eye wears, hand gloves, shoes or helmets to their workers. India has the world's highest accident rate among construction workers, according to a recent study by the International Labour Organization (ILO) that cited one survey by a local aid group showing that 165 out of every 1,000 workers are injured on the job .Construction workers are one of such migratory group. They may not be pure migratory workers but theyhave maximum mobility because of the nature of their work. They have to move from one construction site to another as per the directions of the contractors.

Several factors make them vulnerable like employment which is permanently temporary, the employer-employee relationship is very fragile and most of the time short lived and the work has inherent risk of life and limb due to lack of safety, health and welfare facilities. Death and injury from accidents in the Indian construction sector is widespread. Health hazards in the construction industry can be grouped under mechanical and non-mechanical hazards. Mechanical hazards include accidental issues from impact, penetration from scrap metal and sharp objects and crushing. Non mechanical hazards are a major cause of occupational diseases and physical problems. Improper work hours, piece-rate work often

ISSN (Online) : 2319 – 8753
ISSN (Print) : 2347 - 6710

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization, Volume 3, Special Issue 1, February 2014

International Conference on Engineering Technology and Science-(ICETS'14)

On 10th & 11th February Organized by

Department of CIVIL, CSE, ECE, EEE, MECHNICAL Engg. and S&H of Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

leads to exploitation and extended exposure to hazardous chemicals and processes. No clear distinction between living and working area complicates the problem and exposes relatives and others living in the vicinity to work-related risks.

OSHA STANDARDS, INDIAN STANDARD CODES, LABOUR WELFARE ACTS

2.1OSHA STANDARDS

OSHA standards fall into four categories: General Industry, Construction, Maritime, and Agriculture. OSHA issues standards for a wide variety of workplace hazards, including toxic substances, electrical hazards, fall hazards, hazardous waste, machine hazards, infectious diseases, fire and explosion hazards, and dangerous atmospheres. Employers must comply with the OSH Act's "general duty clause." The General Duty Clause, Section 5(a)(1), requires that each employer "furnish a place of employment which is free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.OSHA standards appear in the Code of Federal Regulations (CFR).The OSHA standards are broken down into Parts. Part 1910 is known as the General Industry Standards.

2.1.1Material Safety Data Sheet

Material Safety Data Sheet also called an MSDS, and what information it supplies. If you are working with a chemical, the MSDS can give you important information about its hazards and the precautions and personal protective equipment needed to work safely with it. It also explains how to use the construction materials safely and how to restore it properly.

2.1.2 Personal Protective Equipment

OSHA requires the use of Personal Protective Equipment (PPE) to reduce employee exposure to hazards when engineering and administrative controls are not feasible or effective in reducing these exposures to acceptable levels. Employers are required to determine, if PPE should be used to protect their workers. If PPE is to be used, a PPE program should be implemented. This program should address the hazards present; the selection, maintenance, and use of PPE; the training of employees; and monitoring of the program to ensure its ongoing effectiveness. 1910.132(f) (which applies to General Industry workplaces) contains detailed training requirements for workers who must wear.

2.1.3TrainingRequired by OSHA Standards

Every employee have right to receive training from their employer on a variety of health and safety hazards and standards, such as chemical right to know, fall protection, confined spaces and personal protective equipment. OSHA standards specifically require the employer to train workers in the safety and health aspects of their jobs. Other OSHA standards make it the employer's responsibility to limit certain job assignments to those who are certified, competent, or qualified meaning that they have had special previous training, in or out of the workplace.

2.1.4 Labelsand Warning Signs

Labels and signs can show hazard information to workers and can be useful in providing additional information and making you aware of a potential safety or health hazard. However, signs are not intended to take the place of actual hazard correction. For example, a "Danger" sign on an unguarded piece of machinery does not meet OSHA requirements because the hazard is still present. OSHA standards such as those for hazard communication, confined space and blood borne pathogens require labels and signs. The employer must make sure that each sign or label posted can be understood by all workers, so the signs must be bilingual if workers do not understand or read English.

2.1.5 Employee Orientation Manuals

Orientation manuals and training materials about your job should include information about how to work safely. As we discussed earlier in this session, employers are required to provide training to workers exposed to certain hazards, including chemicals, falls, and confined spaces. All manuals and training materials should be written clearly and spell out what you need to know about your job hazards. They can also serve as a resource if you have questions or concerns at a later date.

ISSN (Online) : 2319 – 8753
ISSN (Print) : 2347 - 6710

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization, Volume 3, Special Issue 1, February 2014

International Conference on Engineering Technology and Science-(ICETS'14)

On 10th & 11th February Organized by

Department of CIVIL, CSE, ECE, EEE, MECHNICAL Engg. and S&H of Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

2.1.6 Record Keeping

Recordkeeping is an important part of an employer's responsibilities. Keeping records allows OSHA to collect survey material, helps OSHA to identify high-hazard industries, and give suggestion about how to reduce the workers injuries and illnesses in workplace. For specific information on exactly which cases must be recorded, Title 29 of the Code of Federal Regulations (CFR) Part 1904 "Recording and Reporting Occupational Injuries and Illnesses" can be used. The forms that the employer can use are, the Log of Work-Related Injuries and Illnesses (commonly called the OSHA 300 Log) is used to list injuries and illnesses and track days away from work, restricted, or transferred. The Injury and Illness Report (OSHA Form 301) is used to record more information about each case. The Summary (OSHA Form 300A) shows the totals for the year in each category. A company executive must certify that he or she has examined the OSHA Log and believes that the annual summary is correct and complete. The summary must be posted from February 1 to April 30 of each year in a place where notices to workers are usually posted, such as an employee bulletin board.

2.1.7Housekeeping

Housekeeping is the term used to describe the cleaning of the worksite and surrounding area of construction project related debris. It is important for all the construction employers to keep their work place clean. OSHA recommends all the construction work site should be maintained as per the standards. They are work surfaces, passage ways, and stairs must be kept reasonably clear of scrap lumber and debris as per part 1513(a).Ground areas within 6 ft of building under construction must be kept reasonably free of irregularities as per part 1513(b). Storage area and walkways on construction sites must be kept reasonably free of dangerous depressions, obstruction, and debris as per part 1513(c).And part 1549(a) says how the piled or stacked material should be placed in stable stacks to prevent it from falling, slipping, or collapsing.

2.1.8 OSHA Complaint

OSHA has also made a facility to complaint. If any-worker or union representative determine that an OSHA inspection is needed to get workplace hazards corrected in their organization, means they have several options. They can download the complaint form from OSHA's website, complete it and mail or fax it to OSHA.A written, signed complaint submitted to the OSHA area or State Plan office is most likely to result in an onsite inspection. They can also file a complaint online. However, most online complaints are handled by OSHA's phone/fax system, which means the complaints are resolved informally over the phone. They can telephone or visit their local regional or area office to discuss about concerns.

2.2INDIAN STANDARDS

A large number of Indian Standard (IS) codes are available for construction jobsite safety. During one's professional life one normally uses only a handful of them depending on the nature of work they are involved in. Civil engineers engaged in construction activities of large projects usually have to refer to a good number of IS codes. Projects entail use of lots of assorted construction materials in many varieties of structures such as buildings, roads, steel structures, all sorts of foundations and what not. The list of Indian standards provided below is recommended by Indian government to improve the safe work practice in construction industry and to reduce the accident, incident rate.

2.2.1 Personal Protection

Table - 2.1 IS code for personal protection

IS: 1179-1967	Equipment for eye and face protection during welding
IS: 4770-1991	Rubber gloves for electrical purposes
IS: 8519-1977	Guide for selection of industrial safety equipment for body protection
IS: 1224-1985	Safety shoes
IS: 2925-1984	Safety helmets
IS: 8940-1978	Code of practice for maintenance and care of industrial safety equipment eye and face protection
IS: 8990-1978	Code of practice for maintenance and care of industrial safety clothing

ISSN (Online) : 2319 – 8753
ISSN (Print) : 2347 - 6710

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization, Volume 3, Special Issue 1, February 2014

International Conference on Engineering Technology and Science-(ICETS'14)

On 10th & 11th February Organized by

Department of CIVIL, CSE, ECE, EEE, MECHNICAL Engg. and S&H of Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

IS: 10667-1983	Guide for selection of industrial safety for protection of foot and leg
IS: 816-1969	Code of practice for safety and health requirements in electric and gas welding and cutting operations

2.2.2 Civil Engineering Construction

Table - 2.2 IS code for Engineering construction

IS: 2750-1967(Part II)	Steel scaffolds
IS: 4014-1967	Code of practice for steel tubular scaffolding
IS: 3696	Safety code of scaffolds and ladders
IS: 4138-1977	Safety code for working in compressed air
IS: 4912-1978	Safety requirements for floor and wall openings, railings

2.2.3 Fire Protection

Table - 2.3 IS code for Fire Protection

IS: 2190-1992	Code of practice for selection, installation and maintenance of portable first-aid fire extinguishers
IS: 5896	Code of practice for selection, operation and maintenance of fire-fighting appliances
IS: 8433-1984	Code of practice for dissolved acetylene cylinders

2.2.4 Electrical

Table - 2.4 IS code for Electrical

IS: 3043-1987	Code of practice for earthing
IS: 5424-1969	Rubber mats for electrical purposes
IS: 3646 (Part II)	Artificial lightings
IS: 2148	Flame proof electrical fittings

2.2.5 Machineries

Table - 2.5 IS code for Machineries

IS: 1860-1980	Code of practice for installation, operation and maintenance of electric passenger and goods lifts
IS: 8216-1976	Guide for inspection of lift wire ropes
IS: 8964-978	Recommendations for safety conditions for woodworking machines
IS: 9474-1980	Principles of mechanical guarding of machinery
IS: 13367-1992	Code of practice for safe use of cranes

2.3HEALTH AND SAFETY REGULATIONS ACT (1999)

The management of health and safety at work regulations 1999 were made under the Health and Safety at Work Act 1974.This enforces to follow the following parameters at worksite to reduce the possibility of accident occurrence.

Risk Assessment: All employers and self-employed persons are required to assess the risks to both their own employees and others arising out of their undertakings. Then to identify the measures they need to take to comply with the relevant statutory provisions. Such assessments must be reviewed as necessary, and where thereis five or more employee's significant findings must be recorded.

Health and Safety Arrangements: Every employer must make arrangements for the effective planning, organization, control; monitoring and review of the measures previously established as necessary and record the arrangements if five or more people are employed. This may not be a particular exercise if the risks are well known and the means of dealing with them are well established.

Health and Safety Assistance: Every employer must have access to one or more persons to assist him to carry out the measures identified. The traditional role of the safety officer in contracting organizations may become a wider ranging professional role and may design organizations will need their own specialist in this field.

3.0 OBJECTIVES

Since construction is a hazardous industry. The accident rate is high in jobsite. A proper jobsite safety management has to be practiced to reduce the accident rate. The main aim of this study is to improve jobsite safety management practices in small construction firms.

The following steps are carried out to achieve the main objective.

ISSN (Online) : 2319 – 8753
ISSN (Print) : 2347 - 6710

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization, Volume 3, Special Issue 1, February 2014

International Conference on Engineering Technology and Science-(ICETS'14)

On 10th & 11th February Organized by

Department of CIVIL, CSE, ECE, EEE, MECHNICAL Engg. and S&H of Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

- To conduct a survey among small size construction firms jobsite safety management practices.
- To conduct a survey among labour regarding safety condition.
- To analyze the jobsite safety management practice level and labour safety condition from the obtained data.

4.0 METHODOLOGY

The proposed methodology of the study is dramatically represented through the flow chart

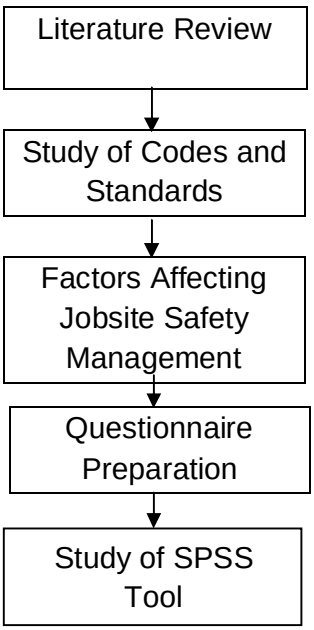

Fig 4.1 Methodology Flow Chart

4.1FACTOR IDENTIFICATION

There are some factors which affects the jobsite safety management at a greater level. These factors were identified based on personal analysis and literature study. Personal analyses of jobsite safety management were done.

- To study the existing jobsite safety management practice.
- To identify the current labour safety problems.
- To identify the available Indian codes, OSHA standards and labour welfare acts for better safety management practice.

4.1.1Use of Personal Protection Equipment

The protective devices made available for individual or collective use of the workers likely to be affected by the hazards of the workplace or process.

4.1.2Falling of Material Object

All building materials stored in tiers shall be stacked, racked, blocked, interlocked or otherwise secured safely to prevent sliding, falling or collapse and in an orderly manner to avoid obstruction of any passageway at the place of work. Materials stored on scaffolds or runways in excess of supplies needed for immediate operations. Material or equipment stored or placed so close to any edge of a floor or platform as to endanger the safety of persons below or working in the vicinity.

4.1.3Falling of Person

All scaffolds/working platforms at height of two meters or more have the possibility of falling of person. All guard-rails for the fencing of floor openings, gangways, and elevated workplaces made by unsound material.Guard-rails having sharp edges and not maintained in good repaircondition.

4.1.4System for EnablingStructure

Ladders or stairs not provided to get on and off scaffold and work platforms .scaffolds and work platforms having debris. Tools and materials kept on scaffolds and platforms. This will make materials fall on workers from tripping. Erect scaffolds are not properly made on firm and level foundations. Finished floors will normally support the load and provide a stable base (Working deck must be 100 level) Scaffold legs must be placed on firm footing and secured from movement or tipping.

4.1.5Machineries

All hands and power tools and similar equipment, are not maintained in safe condition. When power operated tools are designed to accommodate guards, they shall be equipped with such guards. When in use of rotating or moving parts of the equipment shall be similarly guarded.

ISSN (Online) : 2319 – 8753
ISSN (Print) : 2347 - 6710

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization, Volume 3, Special Issue 1, February 2014

International Conference on Engineering Technology and Science-(ICETS'14)

On 10th & 11th February Organized by

Department of CIVIL, CSE, ECE, EEE, MECHNICAL Engg. and S&H of Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

4.1.6Fire Hazard

No proper protection and prevention plan developed and implemented. The specific work practices requiring fire control measures. Open flames and fires are prohibited in all underground construction. The contractor shall educate his or his sub-contractors' men working in the vicinity of fire risk, on how to operate these equipment and know in particular circumstances which type of extinguishers is to be used. The contractor shall take full responsibility for the upkeep and replenishment/refilling of the fixed and portable fire extinguishers.

4.1.7Record and Reporting

Notice of any accident to a worker at the building or construction site that, Causes loss of life or disables a worker from working for a period of 48 hours or more immediately following the accident. The information should be sent by Telephone, Fax, within four hours in case of fatal accidents. Besides the Engineer-in-charge, to where any accident causing disablement that subsequently results in death.

4.1.8Safety Auditing

Besides reporting, it shall be the responsibility of the manager to assign a responsible person to thoroughly investigate all incidents involving near-miss accidents, lost-time and reportable accidents and dangerous occurrences with a view to finding out the causative factor, taking remedial measures and fixing responsibility, and make a copy of the investigation report along with action-plan.

4.1.9Emergency Action Plan

The construction firms shall ensure that an Emergency Action Planis prepared to deal with emergencies arising out of fire and explosion, collapse of lifting appliances and transport equipment, collapse of building, sheds or structure, gas leakage or spillage of dangerous goods or chemicals, drowning of workers, sinking vessels, and Landslides getting workers buried. It is also required that there is a tie-up with the hospitals and fire stations located in the neighbourhood for attending to the casualties promptly and emergency vehicle kept on standby duty during the working hours for the purpose.

4.10Housekeeping

Housekeeping is the process to keep the workplace clean. The site incharge shall be primarily responsible for maintaining good housekeeping and Safety standards in the workplace. Loose materials that are not required for use shall not be placed or left behind so dangerously as to obstruct workplaces or passageways. These are the factors affect safe working, workplaces and passageways that become slippery owing to spillage of oil or other causes shall be cleaned up or strewn with sand, ash or the like, portable equipment shall be returned after use to their designated storage place.

4.11Traffic at Site

Whenever any building or other construction work is being carried on, or is located in close proximity to a road or any other place where any vehicular traffic may cause danger to building workers, it shall be ensured that such building or other construction work is barricaded and suitable warning signs and lights displayed or erected to prevent such danger. All vehicles used at construction site shall comply with the requirements of the Motor Vehicles Act, 1988 (59 of 1988) and the Rules made here under. The driver of a vehicle of any class or description operating at a construction site shall hold a valid driving license under the Motor Vehicles Act. 1988 (59 of 1988).

4.12Electric Hazard

Any building or other construction work, adequate measures shall be taken to prevent any worker from coming into physical contact with any electrical equipment or apparatus, machines or live electrical circuit which may cause electrical hazard during the course of his employment and suitable warning signs shall be displayed and maintained at conspicuous places in Hindi and in local language understood by the majority of the building workers. As far as practicable, no wiring or cable, which may come in contact with water or which may be mechanically damaged or which may result in electric shock.

4.13QUESTIONNAIRE PREPARATION

Based on the literatures and factors considered, a Questionnaire was designed as a measurement tool for jobsite safety management practice. The Safety management practice Questionnaire consists of 66 questions relating factors affecting jobsite safety management. Also the respondents were asked to rate their level of practice to 5 point Likert type scale. To protect privacy,

ISSN (Online) : 2319 – 8753
ISSN (Print) : 2347 - 6710

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization, Volume 3, Special Issue 1, February 2014

International Conference on Engineering Technology and Science-(ICETS'14)

On 10th & 11th February Organized by

Department of CIVIL, CSE, ECE, EEE, MECHNICAL Engg. and S&H of Muthayammal College of Engineering, Rasipuram, Tamilnadu, India

respondents were guaranteed with confidentiality and nondisclosure of their responses. And also a questionnaire was prepared to study the labour safety condition it consist of 30 questions.

4.14 STATISTICAL PRODUCT AND SERVICE SOLUTION

SPSS Statistics can read and write data from text files, other statistics packages, spreadsheets and databases. Statistical output is to a proprietary file format for which, in addition to the in-package viewer, a stand-alone reader can be downloaded. The proprietary output can be exported to text or Microsoft Word, Excel, and other formats. Alternatively, output can be captured as data, as text, tab-delimited text and also graphic image formats.

5.0CONCLUSION:

Thus all the necessary factors which affects the jobsite safety management in constructional projects and factors affecting safety conditions of labours are formulated and questionnaire have been designed in this phase-I.

The questionnaire will be distributed to the corresponding persons who were working as site incharge and labours in construction firms and by making use of SPSS software the response collected from the distributed questionnaire will be analyzed, and appropriate suggestions, recommendations will be given during phase-II.

REFERENCES

1. Abdelahamid, T., Everett, J. 2000. Identifying root causes of construction accidents. Journal of Construction Engineering and Management, 126 (1): 52-60.
2. Bureau of Labor Statistics (BLS). (2010c).Workplace injuries and illnesses 2009, USDL-10-1451, U.S. Dept. of Labor, Washington, DC.
3. Champoux, D and Brun, J-P (2002) Occupational health and safety management in small size enterprises: An overview of the situation and avenues forintervention and research. Safety science, 41(4), 301-18.
4. Goldsmith, D. (1987). Safety Management in Construction and Industry. New York: McGraw Hill.
5. Gambatese, J. A. ~2003. "Pilot study of the viability of designing for construction worker safety." Designing for Safety and Health in Construction: Proc. from a Research and Practice Symp.
6. Huang, X. and Hinze, J. 2003. Analysis of construction worker fall accidents. Journal of Construction Engineering and Management, 129 (3): 262-271
7. Helledi.U (1999) Developing and implementation of an occupational health and safety management system on construction sites-experiences from twelve small and medium-sized contractors. In: Singh, A, Hinze, J and Cobble, R J (Eds.),
8. Jannadi, M.O., Assaf, S., 1998. Safety assessment in the built environment of Saudi Arabia. Safety Science 29 (1), 15–24.
9. Jaselskis, E.J., Anderson, S.D., Russell, J.S., 1996. Strategies for achieving excellence in construction safety performance. Journal of Construction Engineering and Management 122 (1), 61–70.
10. Kartam, N.A., Flood, I. and Koushki, P. (2000). Construction safety in Kuwait: Issues, procedures, problems and recommendations. Safety Science, 36: 163–184.
11. Koehn, E.E., Kothari, R.K. and Pan, C.S. (1995). Safety in developing countries: Professional and bureaucratic problems. *Journal of Construction Engineering and Management*, 121(3): 61–65.
12. Korea Occupational Safety and Health Agency (KOSHA). (2004). Major Accident Cause Analysis Rep., KOSHA, Seoul.
13. Krause, T.R., 1993. Safety and quality: two sides of the same coin. Occupational Hazards (April), 47–50.
14. Laitinen, H., Ruohomaki, I., 1996. The effects of feedback and goal setting on safety performance at two construction sites. Safety Science 24 (1), 61–73.
15. Lim, J. Y., Han, K. K., and Kim, S. K. (2008). "A study of client's role for safety management at construction site." Korea Inst. Build. Constr., 8(5), 75–84.
16. Smith, T. W., III. ~1998. "Site safety: Rights, risks and responsibilities." Civ. Eng. (N.Y.), 68~5, 55.
17. Sawacha, E., Naoum, S. and Fong, D. (1999). Factors affecting safety performance on construction sites. International Journal of Project Management, 5: 309–315.
18. Tam, C.M., Zeng, S.X. and Deng, Z.M. (2004). Identifying elements of poor construction safety management in China. Safety Science, 42: 569–586, Elsevier, Science Direct.
19. Teo, E. A. L., Ling, F. Y. Y., and Chong, A. F. W. (2005). "Framework for project managers to manage construction safety." Int. J. Proj. Manage.23 (4), 329–341.
20. Wong, K., Chan, P. and Lo, K. 1999. Factors affecting the safety performance of contractors and construction sites. Proceedings of the second international conference of CIB working commission W99. Honolulu, Hawaii.

ISSN (Online) : 2319 – 8753
ISSN (Print) : 2347 - 6710

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization, Volume 3, Special Issue 1, February 2014

International Conference on Engineering Technology and Science-(ICETS'14)

On 10th & 11th February Organized by

Department of CIVIL, CSE, ECE, EEE, MECHNICAL Engg. and S&H of Muthayammal College of Engineering, Rasipuram, Tamilnadu, India