An Expert System for Safety Management in Construction Project

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\section*{ABSTRACT}
Word about Site Safe is a small independent organization set up by the construction industry. Its single job is to reduce construction injuries and deaths by taking the lead in promoting construction site safety. The purpose of the study is to examine safety management in the Indian construction industry. Principles are required to take all practical steps to ensure the health and safety of people contracted by them to carry out work of any kind throughout all stages of the project.

In terms of 'best practice', they also have a duty to consider the safety of others who may be affected by the project, such as the public. In general construction safety is analyzed through questionnaire survey collected from the major construction industry.

\textit{Keywords}— Safety and health, Questionnaire, Safety Related Factors.

\section*{I. INTRODUCTION}
Construction industry is one of the most dangerous industries. Construction safety is a cyclic process of planning, scheduling, and analyzing the work and manpower to reduce accidents. A controlled safety management helps to maintain a systematic way to identify accidents and control risks by ensuring proper safety.

In India, the construction industry is the second largest employer next to agriculture whereas it is next to the road accidents in our country. 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 workforce. The construction works in NPCIL, are enormous. 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.

Innovation in the training methodologies to achieve higher effectiveness of training among the contractor employees and implementation of innovative engineering measures to strengthen the safety requirements at design stages to achieve safe working environment during construction.

\section*{II. METHODOLOGY}
The general methodology is the collection of data from an interview questionnaire from different construction firms. The questionnaire consists of two major parts: Safety related factors of firms and their ranking. As the outcome review 20 factors of safety management was identified.

\textit{QUESTIONNAIRE STRUCTURE}
The survey questionnaire is designed to analyze the cross-sectional behavioral pattern of construction safety in the construction industry. The questionnaire was prepared for the pilot survey was formulated by seeing the relevant literatures in the area of construction safety. The interviewer was free to ask additional questions that focused on issues arising during the course of the interview. The questionnaire was tested with a pilot survey for clarity and value of the information that could be gathered. The questionnaire survey is divided into two parts. The first part consists of factors influencing safety and the second part consists of their ranking in different levels.

\section*{III. PRIOR APPROACH}
The objectives of the report were to learn lessons from the scientific and professional literature on the management of safety rules and procedures over the past 25 years. The review considers all rules that have an effect on safety, either exclusively or alongside objectives of production, efficiency, quality, environment and so on. These lessons are presented in a theoretical and a practical form. The theoretical form consists of scientific review of the literature to present what can be concluded from
empirical and theoretical studies of rule-making and rule management from the diverse literature of safety science and related psychological and organizational fields. The practical form consists of stand-alone guidance notes distilled from the scientific review and aimed at senior safety professionals together with a summary intervention plan to help organizations and their consultants review and improve their safety rule and procedure management system.

Andrew Hale (HASTAM) and Dr David Borys (University of Balart in Victoria, Australia) were commissioned to carry out a review of the scientific literature on safety rules and procedures and their management. This formed part of the Research and Development funding by IOSH that year. The commission built on the work already done by the researchers into the literature as presented at the Working on Safety Network conference in Røros, Norway in September 2010.

Hale & Swuste18 introduced a useful distinction between different types of rule, which has been taken up by Blakstad49 (see also Blakstad et al. 50) and Grote et al. 51 in their analysis of rule management in railways (see also Energy Institute6 and Rasmussen36). This distinguishes three types, which differ in the amount of freedom they give to the person following the rule to determine their exact one. Performance goals, which define only what has to be achieved and not how it must be done. These may be in terms of numerical risk targets (eg. risk contours around marshaling yards handling dangerous chemicals; target levels of incidents or accidents) or more qualitative ones, such as “as low as reasonably practicable of sound construction” and so on. Blakstad et al. 50 point out that this type of rule is only feasible if there is feedback of the results of actions, so that their achievement can be made visible. In contrast, the two types below are compatible with feed forward control.

Alper & Karsh101 indicate that violation becomes necessary if the rule in existence does not cover the situation facing the person, or would result in harm if followed. However, they remark that, in all 13 empirical studies they reviewed in detail, and the 30 additional ones they comment on more superficially, violations were seen as exclusively negative. They also report that, in driving tasks, there is a correlation between reported violations and accident involvement, 103 confirming the negative view of violations. However, there is no proof of a similar relationship for work-related violation.

Drach-Zahavy & Somech102 revealed the qualitative trade-offs people made in deciding whether to comply with safety procedures. These included their need to demonstrate care and concern for their patients, causing them not to want to wear PPE against infections for fear of the patients sensing revulsion, and a neglect of their own safety when it clashed with that of their patients, or the speed they needed to show in responding to patient emergencies. Other factors weighing against their own safety were a desire not to disturb colleagues in their work to come and help, eg to lift a heavy patient. There were also effects of the regency of particular accidenttypes, or publicized exposures, weighting the nurses in favor of the relevant safety procedures.

IV. OUR APPROACH

The general methodology of this study relies largely on the survey questionnaire which will be collected from the local building contractors of different sizes by mail or by personnel meeting. A thorough literature review was initially conducted to identify the cost escalation factors that affect the performance of construction industry as a whole.

The survey concluded that safety management is a important factor in construction which will affect the total construction industry. The result regarding how the construction safety will affect the company in Fig.1
VI. CONCLUSION

We can conclude that the safety measures in construction projects will help to contractors for the secure management in the construction field and the labor’s needs. Construction sector should be changed as soon as possible. Currently the Government of India has proposed a safety awareness camp for all the construction workers. Factors affect in safety were identified through literature and expert opinion.

The following are the conclusion of this work
1.) Improper inspection is the major factor affect the project safety. These is because of improper management system
2.) Accidents due to failure of equipment is the another important factor which will affect project safety. Most of the contractors are using local equipment’s for construction.
3.) Improper handling of tools by the workers is due to the lack of knowledge about the work; it may causes hazards and affects the construction safety.
4.) Lack of safety equipment in the construction site will make a unsafe atmosphere throughout the projects and affect the scheduling of total work.
5.) The complexity of work and understanding safety rules and regulation is normally seen in all the construction sites. It becomes reduces by motivating the new ideas and technology among the workers.

REFERENCES