

Risk Assessment of Construction Industry in Delhi NCR Region

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Abstract—Now a day's safety is important issue in the construction industry. Large number of manpower's involved in construction industry of building and other civil engineering structures like bridges, highways, metro etc. So it is important to adopt proper safety in the construction industry in their each type of execution of work. After literature review it is found that very few research works is conducted on the issue of safety and risk assessment of the construction industry in Delhi NCR region. This paper is based on primary research method. This research paper evaluated the various safety measures taken by construction companies of the Delhi NCR region during the period of construction work.

Keywords:- Delhi NCR, Safety, Construction, Risk Assessment.

1. INTRODUCTION

Infrastructure development is now a day's important activity for the growth of any nation of the world. Large number of manpower's are involved in the construction activities throughout the world. So ensuring safety for each manpower involved is important during the execution of construction. Construction work involves the use of heavy machines, various materials, manpower as well as money. Every construction project required large financial stability. So safety and risk assessment in every project is important for the successful completion of project. Construction activities are ongoing in large scale around the Delhi NCR region. It is the basic need to identify the hazards and risks to assess the safety and precautions. Large numbers of high rise structures are in construction phase in Delhi NCR region.

2. LITERATURE REVIEW

Kvien, K., et al., (2013), have developed an innovative risk analysis model to quantify and analyze the safety risk related to loss of containment in the pipeline transport of CO₂. The Bayesian Network (BN) method has been used to analyze the equation for gas dispersion and represents a more complete and internally consistent outcome space for potentially hazardous loss of containment events and subsequent spreading of a CO₂ flame.

Otairu, A. G., et al., (2014), have done survey of construction professionals to determine the reasons for slow

adoption of the Public Private Partnership (PPP) procurement strategy in Nigeria and concluded that government should review their policies to encourage private investors while at the same time creating opportunities for training on PPP procurements for its staff.

Neeraj, S., et al., (2015), have determine the total of 38 factors influencing risk in construction are analyzed through pilot survey which include experts of academic, governmental sectors and construction industry to provide a more effective, accurate and organized decision support tool as the key factors of risk in construction industry.

Reddy, A., (2015), have done study to explore the effective way for implementation of risk management in construction industry and concluded that risk management is strongly linked with the production phase and better project performance can be achieved by identifying, allocating and managing risk at the front end of the project planning process so that participants can address the risks before they turn into bigger problem.

Schlanbusch, R. D., et al., (2016), have studied the challenges and needs of the Nordic building industry in the development in building Life Cycle Assessment (LCA) by applying a semi-structured interview techniques and provides the awareness of the issues that are needed to be addressed and suggested solutions in order for the industry to accelerate and expand the application of LCA in the near future.

3. RESEARCH METHODOLOGY

The research work is based on the primary collected data using the questionnaire through mail to the respondents. The selected respondents were as building contractors mainly from the construction industries of Delhi NCR region. The questionnaire was closed ended as well as open ended type. The five point likert's scale was used for the closed ended questions. The questionnaires consist of the construction risk factors for evaluation of the risk assessment. All the questionnaires are listed below:-

Closed Ended Questions from Q. No. 1 to Q. No. 08 based on five point likert's scale	
Sr.No.	Questions
1	The Staff and Workers involved in construction work get safety prescription before execution of work?
2	The Staff members frequently discuss in group about Risks before Projects?
3	The Machines and Apparatus are in good working conditions?
4	The Staff and members are qualified enough to use the machines and equipments?
5	The tender documents contain the risk assessment clause?
6	The company has medical facility?
7	Company hires safety and quality engineers for the project?
8	Does project handed over in given time?
Open Ended Questions from Q. No. 9 and Q. No. 10	
9	What are the Safety measures that your company takes?
10	Write your suggestion for improvement in safety during construction work.

4. THE RESULTS AND DISCUSSIONS

The questionnaire sends to the 15 experienced persons of different construction industries. Out of which 9 persons answered completely. So, the answers of the 9 well qualified and experienced respondents for this research work have been considered.

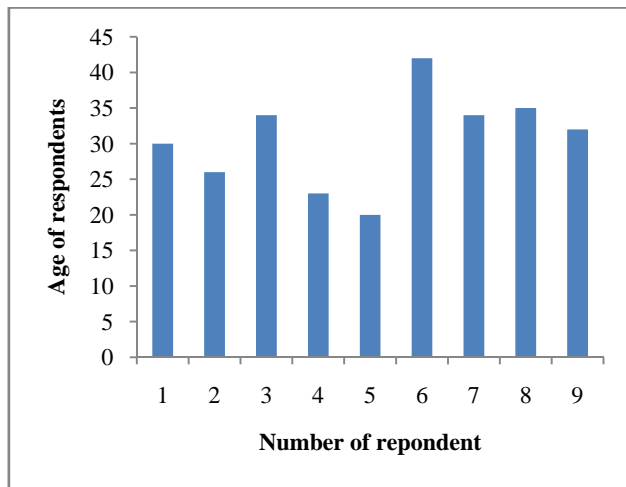


Fig. 1 Information regarding respondents of the construction industry of Delhi NCR region

The response to research question no. 1 indicates that the 56% respondents strongly agree, 33% agree, 11% neutral and 0% disagree from the Delhi NCR region on safety prescription before execution of work in construction industry for staff and workers.

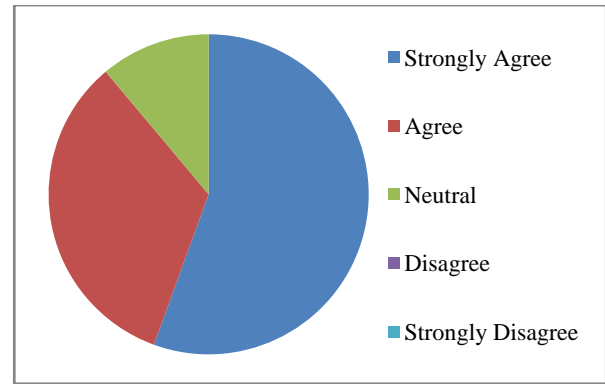


Fig. 2 Responses to Question No. 1

The response to research question no. 2 indicates that the 44% respondents strongly agree, 44% agree, 12% neutral and 0% disagree from the Delhi NCR region that the Staff members frequently discuss in group about Risks before Projects.

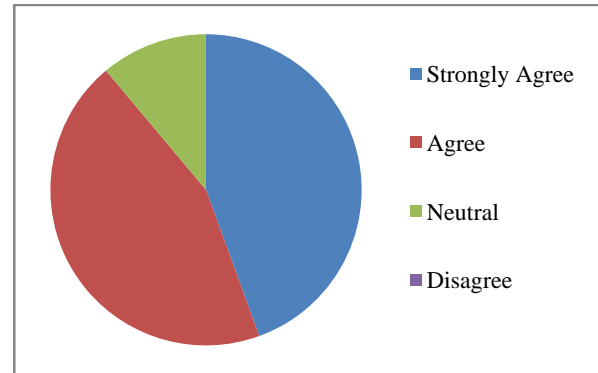


Fig. 3 Responses to Question No. 2

The response to research question no. 3 indicates that the 67% respondents strongly agree, 11% agree, 23% neutral and 0% disagree from the Delhi NCR region about the good working condition of machines and apparatus during construction work.

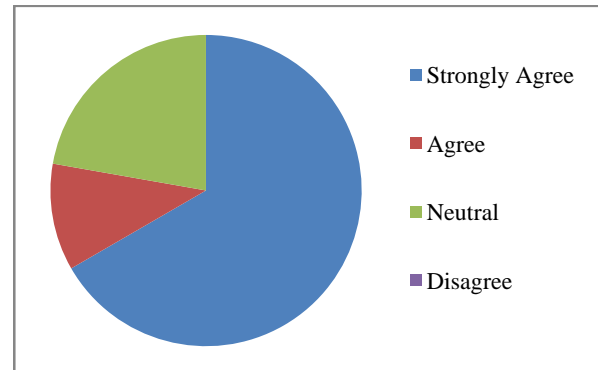


Fig. 4 Responses to Question No. 3

The response to research question no. 4 indicates that the 56% respondents strongly agree, 33% agree, 33% disagree and 0% strongly disagree from the Delhi NCR region that the Staff and members are qualified enough to use the machines and equipments.

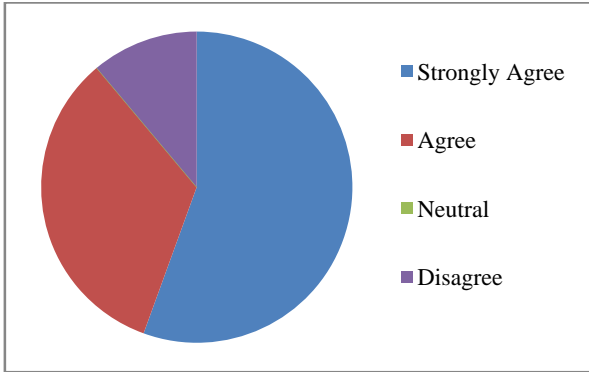


Fig. 5 Responses to Question No. 4

The response to research question no. 5 indicates that the 33% respondents strongly agree, 56% agree, 11% neutral and 0% disagree from the Delhi NCR region that the risk assessment clause should provided in the tender document..

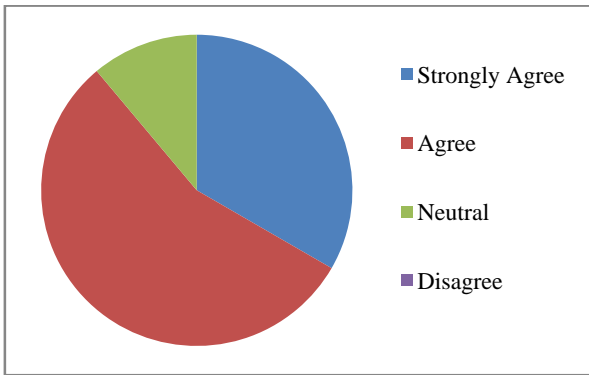


Fig. 6 Responses to Question No. 5

The response to research question no. 6 indicates that the 78% respondents strongly agree, 11% agree, 11% neutral and 0% disagree from the Delhi NCR region that the company has medical facility.

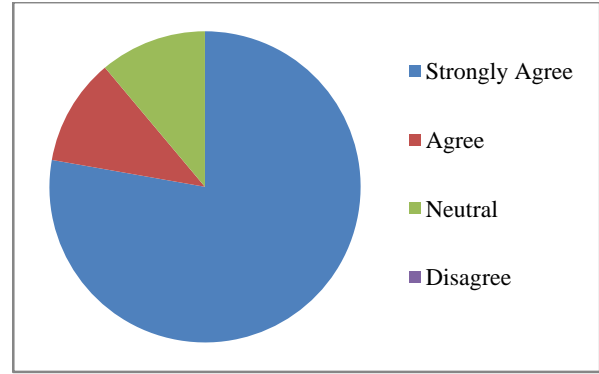


Fig. 7 Responses to Question No. 6

The response to research question no. 7 indicates that the 44% respondents strongly agree, 44% agree, 12% neutral and 0% disagree from the Delhi NCR region that company hires safety and quality engineers for the project.

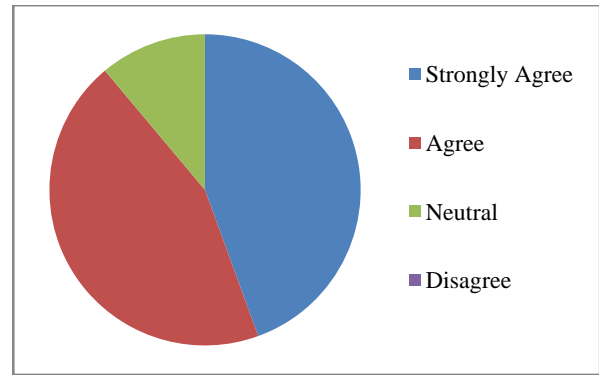


Fig. 8 Responses to Question No. 7

The response to research question no. 8 indicates that the 34% respondents strongly agree, 44% agree, 11% neutral 11% disagree and 0% strongly disagree from the Delhi NCR region that project handed over in given time.

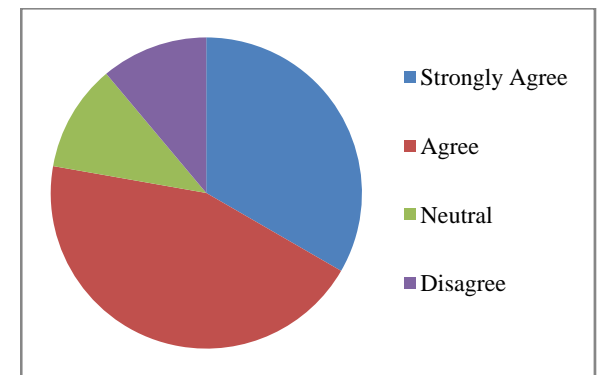


Fig. 9 Responses to Question No. 8

Analysis of responses for open ended research question no. 9:

The respondents mentioned about the various safety measures taken by their companies during the construction work. They mentioned about the safety belts, safety shoes, wear gloves, tool box training (once in a week by safety engineers to give instructions for labour and site staff), helmets, marking tapes and sign boards, proper supervision of staff, safety nets in construction area, personal protective equipments, maintain fencing and prevent fires.

Analysis of responses for open ended research question no. 10:

The various suggestions of respondents about the safety improvements during the construction work are mentioned below:

1. To take safety into tender clauses during project planning.
2. To create accountability at all levels of construction work for safety.
3. To ensure that contractors are pre qualified for safety.
4. While work on height, safety belt must be used.
5. Medical facility should be available near the construction site.
6. No instrument should be allowed without third party test certificate on construction site.
7. To conduct daily site inspection and meeting on safety.
8. To review accidents and near misses.

5. CONCLUSION

Delhi NCR region was selected as sample location for research work activities and the data analyzed from the construction industries of Delhi NCR region can be implemented for the benefits of the all other similar location of India as well as other countries of the World. It is found from the analysis of answers given by the respondents that there is need of regular improvement in the safety division of the construction industry. Awareness and training with respect to safety should be mandatory for all the staff and workers and the implementation of each safety rule should be monitored under the supervision of the experienced safety engineer.

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REFERENCES

- [1] Kvien, K., Flach, T., Solomen, S., Napoles, O. M., Corina Hulsbosch-Dam., and Spruijt, M., "An Integrated Approach For Risk Assessment of CO₂ Infrastructure in the COCATE Project", *Energy Procedia(13)* 2013, pp. 2932-2940.
- [2] Otairu, A. J., Umar, A. A., Zawawi, N. A. W. A., Sodangi, M., and Hammad, D. B., "Slow Adoption of PPPs in Developing Countries: Survey of Nigerian Construction Professionals", in *Proceedings 4th International Symposium on Infrastructure in Developing Countries (IEDC'13)*, Nigeria, *Procedia Engineering* 77 (2014), pp. 188-195.
- [3] Neeraj, S., and Balasubramanian, M., "Assessment of Risk in Construction Industry", *International Research Journal of Engineering and Technology (IRJET'15)*, Volume: 02, Issue: 01, Mar-2015, e-ISSN: 2395-0056, p-ISSN: 2395-0072.
- [4] Reddy, A. S., "Risk Management in Construction Industry- A Case Study", *International Journal of Innovative Research in Science, Engineering and Technology (IJIRSET'15)*, Volume: 04, Issue: 10, Oct-2015, e-ISSN: 2319-8753, p-ISSN: 2447-6710.
- [5] Schlanbusch, R. D., Fufa, S. M., Hakkinen, T., Vares, S., Birgisdottir, H., and Ylmen, P., "Experiences with LCA in the Nordic Building Industry - Challenges, Needs and Solutions", *SBE16 Tallinn and Helsinki Conference; Build Green and Renovate Deep, 5-7 October 2016, Tallinn and Helsinki, Procedia Engineering* 96 (2016), pp. 82-93.